

**A Socio-material approach to understanding the
organization, technology, and society nexus**

By

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ABSTRACT

This thesis suggests that approaches studying the organisation, society and technology nexus have either focused extensively on environment (e.g. Marxist perspectives of organisation and society), or studied organisation and technologies within organisational boundaries (e.g. Giddens's Structuration or Orlikowski's Sociomateriality). Secondly, in doing so these approaches have chosen 'deterministic' stand points that emphasise a single factor, i.e. economy, technology or human agency as being solely responsible for shaping change in the social world.

This thesis proposes that Mutch's socio-material framework (2013), based on CR, provides a comprehensive toolkit for understanding organisations and technologies in relation to society in three ways: through its separation of social and material, by recognising the importance of technology in this interrelationship, and its call for inclusion of context in such discussions.

This thesis suggests that although the Mutch's socio-material framework identifies the importance of context, it does not capitalise on it completely. In response to this void, this thesis contributes to the existing body of literature in three main ways. Firstly, it proposes and illustrates the utility of economic context and its impact on organisational practices. Secondly, it develops and applies the concept of societal context (through the application of social structures of a class system) to elaborate how organisations and their choice of technologies are embedded in a societal context that has considerable impact on different groups of society and vice versa. Thirdly, this work utilises the concept of affordances to help identify the generative mechanisms that can better explain concurrent events that take place when organisational actors, technology and non-organisational actors interact.

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Chapter 1: Introduction to The Thesis

1.1 Introduction

On 26th June 2015, BBC (international) news reported on the prevailing heat wave in Karachi causing 800 deaths in the province. The temperature peaked at 45C (113F) in the region. As per the reports, the situation was made worse by the ‘prolonged power cuts’. The BBC reporter Shahzeb Jillani informed that residents of Karachi, particularly those belonging to middle and low income neighbourhoods, have staged protests against Karachi's monopoly power utility provider, K-Electric, for causing the deaths. Citizens claimed that ‘power cuts prevented the use of air conditioning units or even fans, causing a high death toll’. The news report also mentioned that ‘many of the victims are people from low-income families’ (BBC News, 2015: na). The BBC international report also pointed out the failure of K-Electric to provide uninterrupted power supply to be the main reason behind this calamity.

The news report, a summary of which is presented above, looks at a Pakistani company – K-Electric – whose post privatisation performance has been highly regarded at an international level. Contrary to the company's international image, this report highlights many contested findings; firstly it highlights a critical situation faced by a specific group of society (middle and low-income families in Karachi city) with deadly consequences, claimed to be caused at least partly by the irresponsible behaviour of K-Electric. Secondly, it presents the weak position of law enforcing institutions like the government, and NEPRA (the regulator for power sector in Pakistan) against the unlawful power practices of K-Electric. Most importantly, it tells us how the organisations and their preferred set of practices (SAP system technology in K-Electric's case) have considerable impact on the society they are a part of.

It is this discussion of organisation, its practices (technological choice in this case), and society, that this thesis mainly engages with. In order to explore/investigate the interplay of these complex and interconnected set of entities, this thesis acknowledges the useful insights generated by different competing theories of the field. It is observed from the review of literature (Chapter 2) that theories of technology and organisation have been charged with some kind of ‘determinism’, in one way or the other. For instance, ‘economic determinism- the idea often associated with certain versions of Marxism, [outlines] that economic mechanisms determine

the nature of society' (Mutch, 2008: p. 72). In contrast, theories such as socio-technical systems have been charged with technological determinism - that use of certain technologies will lead to specific outcomes, and only those outcomes. On the one hand, 'against those who might be perceived as technological determinists, [there are theorists like] Orlikowski (1992), who are anxious to stress an approach in which technology is a dynamic factor shaped by human perceptions and actions' - human/agential determinism (Mutch, 2008: p. 76).

Mutch (2008), on the other hand, stresses that 'determinism then suggests a very direct causal link between a particular explanatory variable and a particular result'. The concept of 'determinism' is therefore 'widely discredited in many areas of investigation in favour of more multi-causal models' (p. 72-73). To perform this multi-causal analysis of technology, organisation and society, he rests the foundation of his socio-material approach firmly within the Critical Realism (CR) tradition (Mutch, 2005). The selection of Mutch's socio-material approach is deemed appropriate for this thesis because it engages not only with the discussion of organisation and technology, it also emphasises the role of human agency and context surrounding such discussions.

This thesis both complements and extends Mutch's realist work on the analysis of society, organisation and technology. Mutch's socio-material approach is developed in the backdrop of 'conflationism' of social and material, as presented in the work of Orlikowski (Mutch, 2010 & 2013). Mutch's socio-material analysis provides useful insight in understanding the nexus of organisation, technology and society. Firstly, (as noted above) in response to the different forms of determinism, the socio-material approach considers various factors that contribute to the analysis of what is broadly constituted as social and material. Secondly, unlike other approaches, the socio-material approach is not anxious to outline any single element as the sole determinant of the social phenomenon under observation. Most importantly, it entails that social and material are separate entities, while recognising the importance of both, it emphasises studying the interrelationship between them over a period of time (Mutch, 2010). It is suggested that this activity is vital for establishing truthful accounts about differing aspects/dimensions of social reality.

The socio-material approach is also useful because of its reliance on CR philosophy (Mutch, 2005). The CR philosophy helps the researchers in studying the social phenomena (i.e., or-

ganisation, technology, human agency) in isolation and further breaks down each entity into sub-levels to explore different causal mechanisms that are active within each sub-level, and producing outcomes that are shaping different accounts of reality. Moreover, a CR informed socio-material approach also acknowledges the distinctive set of 'features and powers' possessed by each entity that are then used to produce outcomes that work in their own right. Mutch's (2008 & 2013) work elaborates in detail the importance of these power practices and describes how these activities shape the outcomes. As this research mainly borrows the concepts from the CR tradition for the purpose of conceptual clarity, the attributes of CR (Bhaskar, 1975) and its engagement with the socio-material approach are explored in detail in Chapter 3 of the thesis. This thesis supports the notion that there are dimensions of compatibility between CR and the socio-material approach which provide utility for the analysis of the social and material. Work by Alistair Mutch (2002, 2005, 2010) is drawn on to delineate the ontological status of socio-material concepts.

Although, as briefly described above (and to be discussed in detail in the literature review chapter), the socio-material approach generates great insights that help in understanding the organisation and society paradox, but this thesis suggests there is still room for development. This thesis argues that although Mutch's socio-material approach (2013) highlights the importance of context but it does not dwell in detail on the concept. It is observed that organisations are embedded in the macro-economic context of the state and the societal context surrounding their operations/practices. This concept of socio-economic context is developed and applied in order to understand how K-Electric's practices broadly, and its choice of SAP technology, were influenced/shaped by its economic context. Additionally, at a societal level, it helps in identifying the impact of implementation of SAP technology on the society in which K-Electric was operating. The discussion of technology then highlights the other shortcoming of Mutch's socio-material approach. Once again, unlike other CR accounts, where agency is supposedly preferred over structure, Mutch does recognise the importance of technology, but doesn't fully highlight its potential contribution to the change process. We argue that the concept of affordances of technology, as used by Leonardi (2011), Strong et al. (2014), Volkoff and Strong (2013) and its application to Mutch's socio-materiality, provides a great deal of analytical support for the underpinning of technology enabled change. Within the field of IS (Information Systems), affordances are thought of as initial building blocks of a larger concept, and generative mechanisms which help identify underlying causes of IT enabled change. Lastly, we argue that by utilising the concept of affordances of technology in

the current theorisation of social and material, we can look at the differential impact created by similar technologies when actualised in various contextual conditions.

1.2 The Case Study

We have attempted to highlight our contribution by studying a large technical system – SAP technology – whose ISU (Industrial Solution for Utilities) version is specifically designed and developed to allow utility providing organisations to simultaneously integrate and automate their core business functions (Azm, 2009). Our study of the wider economic context suggested that the privatisation of K-Electric (a national company for almost a century) was set out against a backdrop of a strong influence of macro-economic actors (the IMF and World Bank), in the state level policy making of Pakistan (Pasha et al., 1999). In this regard, it was actually the economic context of Pakistan that set the case for privatisation and the subsequent change of K-Electric's management (Peter, 2011).

It was also observed that the post privatisation transformation of K-Electric was entirely based around the implementation of the SAP system (Azm, 2009). However, as the events unfolded, it became apparent that the technological change brought forward by K-Electric was motivated by the company's desire to put in practice a technological system that can work in their own right (Shafa, 2014). Since the SAP technology enabled the management to achieve the desired results (earning profits on their investment), the company neglected to acknowledge various societal groups' rejection of and resistance to the new business practices adopted by K-Electric (Dawn, 2015).

This thesis identified that the organisation and various groups of society associated different meanings to and perceived the technological change of K-Electric in different ways. In what follows, the case study highlights the social repercussions of the organisational change by focusing on two contesting and extreme perspectives on the implementation of technology within the K-Electric company. On one hand, the implementation of SAP technology was being presented as a success story by the management and international academics, where K-Electric, famously known as a classic loss making enterprise, started generating revenue after 17 years of consecutive losses (Hasan, 2014: I). The SAP system helped the company in recovering their costs and identifying areas of improvement. Additionally, change in the corporate culture as a result of SAP implementation has helped them in getting closer to their customers and to provide better and faster customer services (Azm, 2013). Contrary to this, cus-

customer dissatisfaction with K-Electric's policies and practices increased considerably in the post-privatisation period. The entire privatisation and modernisation episode of K-Electric was being termed as a complete disaster by the citizens of Karachi and the local media (The News, 2015). The public's perception of this transformation process was that it has enabled K-Electric to control its power supply to different regions of the city, practice unscheduled blackouts, and establish a system that allows the company to deliberately penalise its customers and charge more by not facilitating any corrections to wrongly issued bills (Husain, 2015), even when the government and regulatory body for the power sector, NEPRA (National Electricity and Power Regulating Authority) started voicing concerns over the deliberate exploitation of elements of the SAP system by the company in order to make money while compromising the transparency of processes (Abbasi, 2011).

1.3 The Research

The motivation behind this research was to highlight the role/activity of powerful macro-economic players the IMF and World Bank, as situated in the wider economic context of Pakistan. In doing so it was revealed that recent approaches that study organisations and technologies do not really engage with the issues of wider context. For instance, the socio-technical systems approach has explored the relationship between organisation and technology in a closed system as if organisations were sealed entities free of outer influences (see for example Eric Trist's 1963 work). It is argued that researchers within the socio-technical domain have not focused on locating their analysis of technology outside the organisational boundaries, thus indirectly succumbing to the belief that resistance or acceptance of technologies within organisational settings is solely dependent upon the end user/employees. It was then noted that Mutch's (2008) work acknowledges the significance of the broader context in the organisational studies literature. Mutch (2008: p. 74) asserts, 'all organisations are embedded in a wider context with which they interact'. However, as we will discuss in the literature review chapter, the concept of a wider socio-economic context is not fully developed in the socio-material approach as either. This thesis highlights the fact that the implementation of different technological forms are subject to the organisational as well as the wider socio-economic context surrounding them. Although we do agree that technologies are embedded in an organisational context, and given their first hand use by the employees of an organization, it is important to study the technologies in the organisational context. However, what is stressed here is the need to include both social and economic structures in the socio-material approach, because organisations do not exist in isolation; they are very much a part

of social and economic structures, therefore what happens inside the organisation can have a significant impact on these outer structures and vice versa (Mutch, 2008).

This thesis proposes/suggests developing a socio-economic contextual frame work where technological systems, actors involved, power structures (institutions/rules), and social groups are all interlinked, and together they contribute to the analysis of organisation, technology and society. It is also argued that it is important to understand this multi-level analysis, especially when technological transfers/advancements/implementations are carried out in an international context (Geels, 2004). In order to develop and apply the concept of context within the present socio-material frame work, this thesis classifies the wider context surrounding organisations into two broad categories: social context, and economic context. As identified in the Marxist tradition (see for example Marx; 1964, 1967 and Burawoy; 1983, 1992), the inclusion of economic context can help in identifying influences that can shape the way organisations operate. These economic influences can take a variety of forms, ranging from government policies regarding the economic situation of the country in which the organisation is located, and the involvement of macro-economic players (such as the IMF and World Bank) that are embedded in the economic context. It is stressed that the activity of these macro-economic players is not fully explored in the socio-material analysis, and therefore we know less about the capabilities of these actors to enforce the implementation of their desired practices. As the case study will present, the power vested in these economic actors puts them in position of authority to block the resistance posed by states against their preferred policies (Jones & Hardstaff, 2005). This thesis, through the narration of K-Electric's case study, contributes to the understanding of how power is exercised by these actors to dislocate states from the process of state level policy making.

Another proposition of this thesis is the involvement of local societal groups in the analysis of 'organisation and technologies'. Once again, this dimension of organisational analysis is not unknown. Friedland & Alford (1991: p. 232) assert that it is not possible to understand individual or organisational behaviour without locating it in a societal context. However, we reiterate that the concept of societal groups as divided in a class system is not fully developed in the socio-material framing. As will be identified from the case study, various social groups located in the societal context are capable of facilitating as well as resisting different technological forms put in practice by organisations. It is suggested that the inclusion of these social groups in socio-material analysis will prove helpful in explaining the fact that it is not just structures in technology or structures within organisation, but structures in society that also

contribute to the design and reaction towards different technological forms. Moreover, this theorisation will also unveil the power practices, as identified in Mutch's realist work (2013), that shape the processes (outcomes) by which societal resistance is ignored by the organisations in the cases of technological transformation, even when such transformations are by and large imposing negative impacts on society.

In order to fill this void, this thesis contributes to the existing organisation studies literature by posing the following questions:

Research Question 1:

- Why is it important to study the wider societal context surrounding organisation and technology?
 - How does society relate to the organisational use of technology?
 - How do the interplay of technology and organisational actors impact societal structures such as the social class system?

Research Question 2:

- How and why do similar technologies provide capabilities/options for the differential treatment of social class?
 - How and why do the material properties of technologies offer affordances in some contexts and not others?
 - What mechanisms can explain the differential experiences of separate societal groups arising from interaction with similar technologies?

Research Question 3:

- How does the concept of social structure and the class system relate to socio-material theorising in organisation studies?
 - What utility does the concept of affordances provide in CR informed socio-material approaches?

1.4 Overview of This Thesis

After the introduction, the chapters are as follows: Chapter 2 of this thesis engages rigorously with the theoretical framework underpinning this thesis. It starts by providing an overview of other competing theories in the organisational field, contributing to the discussion of organisation, technology and society dimensions of the social world in one way or another. In this chapter the researcher outlines useful insights generated through the careful review of these competing accounts. For clarity and better understanding, this chapter is divided into two sections; the first sheds light on the importance of context in the studies of organisation and technology. In this section it is argued that studying the context can help the researchers to explore different forces such as power, politics, and society, and including these forces in the discussion of organisation and technology can yield better analysis. This section focuses on the different approaches, such as the STS approach associated with the work of the Tavistock group of researchers, that explores the impact of technology on the organisation's traditional/historical work arrangements (Trist, 1981). Whereas, the Marxist (1867; 1976) work is set against the backdrop of a capitalist economy, focuses on how the capitalist system determines the division of social class into two polarised group: owners of capital, and workers who are willing to sell their labour for money. Based around this class conflict, the Marxist approach explains how technological artefacts are used by organisations to control and suppress the workforce. On the other hand, Braverman's (1974) work emphasises on deskilling of the labour through the adoption of technological forms of production. Just like Marx, automation of work processes is central to his approach, as it diminishes the control of labour on the production process. While, Burawoy's (1979 & 1983) approach, once again situated in the economic context, focuses on the politics of the production process within 'factory regimes' where workers have power to negotiate their wages based on the value they add to the production process. Winner's (1980) techno-political approach highlights the political implications of different technological forms within a wider socio-economic context.

The second section of this chapter deals with defining the ontological positioning of this thesis in relation to the socio-material approach. In this section, we discuss various theoretical standpoints along with identifying their strengths and weaknesses. For instance, we agree with the Actor Network theorist's efforts to highlight the importance of networks that surround socio-material activity and pronounce it to be a perspective that other approaches can learn from. On the other hand, we do not support the idea of belittling both social and material dimensions and assigning them equal weightage while focusing entirely on the networks.

Similarly, we appreciate Orlikowski's work on groupware technologies and her field contribution in focusing on how these technologies are perceived and used by organisational actors (employees). However, our point of disagreement with her approach is two-fold: firstly, we argue that her entanglement of social and material does not allow room for analysing agency and structure separately, and secondly, her over emphasis of human agency that actually belittles the role of technology in the change process. Finally, we pen down and draw upon Mutch's CR inspired socio-materiality. We stress that Mutch's approach is more comprehensive as it hints at the importance of a wider context that will facilitate better understanding of socio-material phenomenon. Additionally, and unlike the criticism that follows the CR researchers, his work spells out the importance of technology instead of just focusing on human agency. Therefore, we consider his approach as suitable for our underpinning of IT enabled differential change by proposing several extensions to the work.

Chapter 3 of this thesis describes the entire research design as adopted by this thesis. This chapter details the ontological standpoint of the researcher and how this ontological clarity frames the choice of research methods adopted in this study. This chapter describes the struggle of the researcher and the difficulties faced during the research process. It also focuses on how the analysis of qualitative data set was performed by the researcher, and follows the process of CR informed data analysis as applied by Bygstad et al. (2016). The six steps from Bygstad et al.'s work were used to outline and categorise important themes emerging from the data. Furthermore, these themes help retroduce both affordances and generative mechanisms from the events of considerable importance. Additionally, the process involved exploring the relationship between key themes. These themes included organisation (K-Electric), technology (SAP system) and the societal context surrounding them, and the role of human agency in maintaining and guiding the interplay of these structural entities. At this stage, associations between the organisational actors, technology and non-organisational actors were identified. From this association we traced the deep level structures, affordances and the generative mechanisms responsible for shaping the events observable at an empirical level.

Subsequently, the sources of information used to develop this thesis were outlined. At this stage the selection of research site and appropriate methodology was explained. The K-Electric company was deemed as an appropriate research site. This selection was made because of the direct involvement of macro-economic players, namely the IMF and World Bank, in the privatisation of a company that has otherwise remained state owned for 90 years.

Additionally, the new management's decision to implement the SAP technological system, and the series of events following this decision made it a promising research site. To carry out the research, textual data and semi-structured interviews were adopted to gather information about the K-Electric company and its decision to implement SAP technology. These data sources were selected not only because they were compatible with the researcher's questions, but also because they provided the richness needed to develop a strong evidence backed case study.

Following the CR informed data analysis and retrodution, the hypothetical interrelationship between theoretical themes was identified. This mainly involved explaining the process of data analysis. At this stage the researcher created a table to represent the chronological occurrence of major events. The analysis of initial data highlighted the need for more data to be collected. To serve this purpose a second data trip was planned. Finally, throughout the research project the researcher kept moving back and forth between the theoretical concepts and the empirical findings.

The methodology chapter leads to a detailed discussion of the case study of 'K-Electric, its use of the SAP system technology, and the wider socio-economic context surrounding it'. Adopting Critical Realism tradition case study is decomposed in three levels each level is discussed separately in the form of a complete chapter. This is done keeping in mind the purpose of this thesis, which is to provide details of events occurring within each level individually, so as to outline how these events contribute to the presentation of the case study within this thesis.

Chapter 4, in this regard, presents a macro picture of the economic context of Pakistan. In doing so, it sets up the background that causes the main events to occur at a macro level, such as the correlation between the economic instability of Pakistan and the powerful activity of the IMF and World Bank that has lead to the privatisation of many state owned entities, including K-Electric. This chapter also explores the interrelationship/interdependencies between elite institutions, i.e., The IMF, World Bank, the government of Pakistan, NEPRA, and the K-Electric company. It also engages with a detailed discussion on how the macro-economic and micro (organisational) events caused the drastic changes within organisational boundaries and their impact on society.

Chapter 5 focuses extensively on the SAP system and the ‘technology dimension’ of organisational analysis. This chapter describes in detail the deliberate implications of the SAP system within organisational settings. This involves exploring how the company used various components of the SAP system solely to afford their desired goals. This chapter further details the process adopted by the company to link all its business operations with the SAP technology. A discussion on the architectural design of the SAP system (its hardware configuration) is penned down along with defining the long term IT goals of K-Electric. This chapter also compares the actual against the claimed impact of SAP technology on consumers.

Chapter 6 sheds light on the governance mechanism (particularly the role of regulator, NEPRA) of K-Electric and describes in detail the post SAP implementation performance of the company. This performance is then compared with the claims of the company about the expected performance of SAP in the period preceding its implementation. In this chapter, the author explores how NEPRA’s weaker position as the power regulator provided the contextual affordance for K-Electric’s management to continue with their preferred work arrangements.

Chapter 7 (the discussion chapter) summarises the main findings of this thesis. It also engages in a discussion on how these findings were informed by both the socio-material theory and CR philosophy. Following the key findings of this study, the author discusses how the concepts of context, society, affordances of technology and generative mechanisms contribute to extensions to Mutch’s present socio-material framework.

Chapter 8 states the concluding remarks of the researcher about this thesis. This chapter also highlights the limitations of this thesis along with outlining promising and interesting future prospects for further research around the organisation, technology and society debate.

Chapter 2: Literature Review

2.1 Introduction

For a long time, scholars have engaged with different theoretical perspectives to generate useful insight concerning the organisations and technology nexus; this chapter suggests that there is still room for development. This review engages rigorously with multiple bodies of documented work on the said topic and, with their advantages and limitations, implies that these varying traditions provide the opportunity to build a more comprehensive account of organisation, technology and society. This review contributes to the existing literature in four ways. Firstly, it points out that, despite a wide range of theoretical approaches underpinning the usage of technology in varying contexts, we still lack a multi-layered framework of analysis that considers a variety of factors, such as organisation, structures, potential powers, technologies, human agency and society, and simultaneously explains how the interplay of these factors shape social events.

Secondly, by doing this we point out the need for a framework that can both locate and explain organisation and its use of technology and how it impacts society, without falling into any sort of ‘determinism’. The need for this multi-causal framework arises because generally the theories around organisation and technology have fallen into ‘determinism’ of one form or another. Where the Marxist approach stresses that the nature of any society is determined by its economy- ‘economic determinism’ (Mutch, 2008: p. 72), the Socio-technical Systems (STS) approach outlines that it is actually technology that shapes and produces certain outcomes- ‘technological determinism’. In direct contrast to technological determinism, the socio-material approach stresses that technologies are indeed shaped by human perceptions and actions- ‘human/agential determinism’ (Orlikowski, 1992). Yet, in the presence of all these deterministic approaches, we know little about how the organisation’s use of technology is related to the wider societal context in which the organisation is situated. This work suggests that not only organisational actors, but also non-organisational actors (customers) impact and are directly affected by the organisation’s choice of certain technological forms.

Thirdly, unlike recent literature on the topic, this thesis does not shy away from acknowledging technology’s importance within organisational studies. The discussion of technology and understanding technology enabled change is deemed important because organisations are in-

creasingly using Enterprise Systems (ES) of one form or another to support, improve and integrate their business functions (Volkoff & Strong, 2013). Revised theoretical perspectives are needed to explain the role of technology, its relative independence, materiality and endurance (Volkoff et al., 2007). This theoretical lens would help in identifying the practical implications modern technologies have for human actions. The effects of ES technology on both organisational and non-organisational actors are at times widespread and differential. That said, technological designs do not place humans at their mercy, as people have agency (free will), practicing which they can opt to change the impact of technology and enable change in many ways, i.e, by redesigning, modifying or, at the very least, by opting not to use technology at all (Leonardi & Barley, 2008). Throughout this review we will discuss various studies of ES enabled organisational change to highlight the importance of technology in the study of organisation. We will draw on a series of works by Volkoff, Strong and colleagues on ES systems (EHR Electronic Health Records and SAP Systems Applications and Products) and organisational change initiated by their implementation.

This review identifies that researchers that have paid attention to technology and its material aspects have only recently engaged in the discussion of technology's ability to impose certain restrictions and offer opportunities for its use by different user groups (Affordances) (Leonardi, 2009 & 2011; Mazmanian, 2013; Volkoff & Strong, 2013; Strong et al., 2014). The idea of affordances of technology, that engages with the differential impact of similar technologies in various settings, has only recently been incorporated in the organisational literature, and is still research dependent in its further development. For instance, how similar technologies offer different affordances when actualised in different contextual arrangements (such as developed versus developing countries) is not understood. We argue that answers to these questions are deeply rooted in the discussion of power, politics, and structural arrangements operating in the wider econo-political context.

The purpose of this review is not to marginalise the importance of any of the above theories, but to capitalise on the unique offerings of these approaches, and later use the distinctive features of their analysis to develop a framework that offers a comprehensive tool kit for understanding the organisations and technologies in relation to their socio-economic context. For instance, this review acknowledges the importance of economic context and its ability to shape organisational outcomes/choices, and thereby recognises the importance of Marxist social analysis. On the other hand, it appreciates the notion of 'the political implications of

technologies', as presented in Winner's (1990) work, and explains how this analysis provides useful insight into understanding the process of implementation of otherwise contesting technologies within organisational settings.

In the process of formulating this comprehensive analysis, where technology, organisation, context and structures are all seen as important, i.e. none of the factors are deemed solely responsible for shaping events in a certain way and that way only, it was necessary to choose an ontological standpoint that allows for such a detailed analysis. This analysis would observe the interplay of different entities rather than looking for a deterministic relationship. As a result, one of the major motivations behind development of this chapter is discovering the conceptual clarity of the ontological issues. To serve this purpose, greater attention is paid to exploring and explaining different ontological assumptions chosen by various researchers to underpin the organisation and technology nexus. This section will identify that, while some authors have over emphasised epistemology and thus presented a flat ontology that fails to differentiate between human and non-human actors e.g. Actor-Network Theory ANT (Latour, 1987; Barad, 1996), other theoretical accounts are charged with conflationism of agency and structure, so much so that it does not allow for individual development of both, in the analysis of technology and organisation (Giddens, 1984; Orlikowski, 2007). It is with regards to these ontological limitations/ambiguities that we suggest approaches like Archer's morphogenetics (1995 & 2000) and Mutch's Socio-material (2002, 2005 & 2013), belonging to the Critical Realism (CR) tradition, which provide greater ontology than that presented in other competing accounts of organisation, technology and society.

As can be noted from the above discussion, the purpose of this review is three-fold; Firstly, to stress the importance of both the econo-political and societal context surrounding the organisation and technologies. Secondly, to highlight the significance of technology in its material properties and affordances that produce differential outcomes in different geographical settings. Lastly, to develop a multi-layered analytical framework that facilitates comprehensive discussion of the context, organisations and technology. To carry out the above task the chapter is divided into two sections. The first section of the chapter engages in a discussion of the theories, with extensive focus on wider context, and collectively emphasising the role of technology in shaping behaviours. In this section we will discuss theories that are either inspired by Marxist interpretation of the use of technology, or are castigated due to their technological determinism. The second section of the chapter provides an overview of the com-

peting theories of technology in relation to society, along with their philosophical associations. Setting up a review of related literature in this way renders visible the neglect of serious consideration of technology and ontology in these competing accounts of organisation and technology. This in turn will support our assumption that although all of these approaches are useful in understanding the technology and organisation paradox, Mutch's socio-material theory, as based on critical realism philosophy, offers valuable insight into understanding technology, organisation, society and the wider context surrounding them (Ackroyd and Fleetwood, 2004). Through this section of the chapter, the discussions will be aimed at clarifying why the CR perspective offers greater clarity than other philosophical stances, and is adopted to analyse the structure and organisational context.

Our last contribution to the existing body of work stresses that Mutch's socio-material framework (2013), based on CR philosophy, is deemed as appropriate theoretical framework to support the findings of this thesis. In doing so, this chapter both complements and extends Mutch's socio-material approach by proposing the inclusion of wider social structures such as stratified societal arrangements, divided into class systems and macro-economic actors (e.g. the IMF, World Bank, IFC), as embedded within wider economic structures. This work also implies that Mutch's socio-material approach can benefit greatly from in-depth discussion of the role of technology and its affordances.

2.2 Wider Context and Technological Determinism

Technology has been discussed in organisational literature debates from various different perspectives. It is argued that these distinctive approaches reveal a width of different focuses and concerns in writing around technology. As we will see in this section, there is a large amount of research that focuses on the context that surrounds both organisation and technology. These approaches offer a range of perspectives from which to study organisations in the given context. The following section presents a detailed discussion of these theories and their usefulness in organisational analysis.

2.2.1 Socio-Technical Systems Approach (STS)

A dominant theory for the researchers within organisation literature has been socio-technical systems that link technology with organisational change (Mutch, 2008). Authors using the STS approach provide a logical and systematic analyses of changes within organisation of

work with the advent of new production technologies in the work place. This approach suggests that the use and effectiveness of technology is dependent upon the complex interactions between technology, organisation, context and users. While locating the technological structures within organisational structures, focus has been placed on various aspects of both technology and organisation. For example, some have tried to emphasise the material aspects of technology (Orlikowski, 2007), whilst others have focused on the rules, norms, power structures, and set of choices available to organisational managers which guide the actor's perception and activities (Geels, 2004: p. 899).

The socio-technical approach was first used by the Tavistock institute research group that is a part of the University of London (Trist, 1981). This group of researchers, under the supervision of Eric Trist (1963), was exploring the impact of technology in the coal mining industry. Their research found that replacing manual coal mining processes with new technological forms resulted in a decline in productivity as opposed to an expected growth in production. Trist (1963) attributed the failure of mechanised forms of work to produce desired outcomes with strong social links that were established between the company employees. Since coal mining is dangerous work, and mines were located at a distance from villages, the employees lived together at the site and developed strong links with each other. Moreover, a strong bond of trust existed between the workers, where the supervisor/leader was paid the salary of all group members and workers than collected wages from the leader. The employees traditionally shared a collective belief that at the end of shift the site should be left in a tidy condition so that workers could go back to work as soon as they start the shift in the morning. The implementation of machinery thus disrupted this ethos and the traditional work arrangements. The workers now had to follow technical methods of performing a job that were directly at odds with the social and individual perceptions deeply rooted within employees. The mechanical work logic in this case failed to translate traditional working norms into new working patterns. Under the new working arrangements, employees had to spend extra time cleaning up the mess of last shift before being able to restart work in the morning, as a result, productivity declined.

In summary, the Tavistock researchers identified that the traditional work arrangements carried strong social and individual meanings that were deeply rooted in the way employees interacted with each other and performed their job. Whereas under the new technical arrangements these social dimensions were not being addressed fully, thus leading to less productiv-

ity (Trist, 1963). The socio-technical approach, despite being influential in the organisational studies literature, was criticised for its technological determinism (Mutch, 2008), as it overstated the impact of technology by linking it to the revolutionisation of nature and location of work. This approach was criticised on account that it suggested that technology will lead to specific outcomes such as adoption of new organisational forms or new work arrangements, and only these arrangements. The deterministic view of technology neglects the role of human actions and choices available to human actors, especially those with power to effect the structural arrangement. Nonetheless, the socio-technical approach remains important because it identifies the relationship between social aspects of the activity of work and technological forms adopted by organisations.

2.2.2 Marxist Approach

Karl Marx's work sheds light on the relationship between economy and other aspects of society. Marx's theory of 'base and superstructure' was distinctive because of the emphasis given to economy (the 'base' of his theoretical framework). Unlike others accounts that emphasised the importance of novel ideas as a prerequisite for social change, his analysis of social change was linked with economic conditions surrounding societies (Bruce & Yearly, 2006). According to Marx, there was a consistent interrelationship between different elements that were considered important in a society. This included the ownership of 'means of production', the activity of 'organising the work', and everything else of importance.

Marx was particularly interested in exploring the concept of 'alienation' that represented workers' 'lack of control over the production and disposal of their product'. Marx collectively referred to all societies as 'class societies', where people are pitted against each other depending on their relationship to the 'means of production'. His work set in the era of capitalism draws a division in society between those who own the capital and those who have to sell their 'labour power' in order to survive. For Marx, the relationship between management and workers within an organisational context (of capitalist control) encapsulates the characteristics of the class conflict prevailing in capitalist society. Marxism discerns 'management's use of technology to suppress the working class' (Dean et al., 1992: p. 205), and therefore views capitalism as destructive, especially for the organisational work force (Adler, 2007).

The Marxist approach is vital because it not just describes the existing social division, but focuses on how social evolution or social change is caused by the 'class conflict'. For instance, Marx stresses that capitalistic/autocratic production processes favour the employers through its advent of technological work arrangements to achieve greater control over the workforce (Burawoy, 1992: p. 18). This in turn leads to the class struggle of two antagonistic groups; employer and worker (Marx, 1964; Goldman and Van Houten, 1977). Marx argued that the unprivileged working class will than resist a capitalist economy and push for change in order to create a socialist economy.

Marx's work is important in many ways; firstly it provides useful insight on the use of technology, as adopted under capitalist society to suppress the working class (Burawoy, 1983). Secondly, it draws our attention to the discussion of economic context (that is otherwise only loosely defined in other accounts, if at all) and its impact on organisational practices (Mutch, 2008). Thirdly, it brings in and thereby highlights the discussion of class conflict and division of class in the discussions of organisation and technology (Bruce & Yearly, 2006). Lastly, Marx provides what can be loosely called a 'realist account of analysis' as he suggests that in order to understand people, their inter-relationship with each other and social structures must be known. However, Marx's view is castigated with 'economic determinism' that overstates the ability of context to shape the organisational outcomes. On the other hand, the division of class system as described in Marx's approach presents only two polarised accounts: employers (dominant class with control over capital, material, factories and equipment), and workers (a lower class entity that is totally powerless) (Heydebrand, 1975). The problem with this theorisation is that firstly the division of class system is sketchy because it involves no discussion of a middle class (Bruce & Yearly, 2006). Secondly, Marx's approach focuses extensively on the social class as the only social structure on which to study the effects of capitalism and technology. This is to say that, although social class is an important dimension of social structures, this view downplays the significance of other aspects of social stratification and identity such as gender, ethnicity, religion, politics etc. (Adler, 2007). Thirdly, his work overemphasises the technical production processes adopted by capitalist managers and downplays the role of human agency, especially that of the working class. His portrayal of the working class is that of powerless people who are struggling hard to survive under the capitalist system. For instance, he argues that capitalists compete in the market by replacing conventional methods of production with technological systems, by adopting new ways of man-

aging and getting the work done, and by reducing the wages of the workforce (Burawoy, 1992: p. 18).

2.2.3 Braverman's 'Deskilling' Approach

Similar traces can be found in the work of Braverman (1974), whose perspective is focused on exploring how management 'deskills' the craftsmanship of its workers by adopting technological methods of production, especially under industrial capitalism. According to Braverman, the consolidating characteristics of advancements in the production process can actually be seen as 'the progressive elimination of the control functions of the worker [and] their transfer to a device which is controlled ... by management' (1974: p. 212). In this way, his notion of control over the labour resembles that of Marx, which stresses that, under capitalism the labour becomes a mere 'watchman' and 'steps to the side of production processes instead of being its chief actor' (Marx, 1858: p. 284). The capitalists control the means of production (through private ownership of resources) and use them to exploit the skills of the working class in order to overcome market competition. The capitalist systems of production (that drive firms to degrade and deskill work) thus reproduce abject poverty at one extreme and obscene wealth at the other.

Another important aspect of Braverman's analysis is his discussion of the emergence of a managerial class that dominates the knowledge and holds control over the production process. This managerial class then applies the control mechanism through subdivision of work into small tasks and by the supervision of the work force. Within business organisations, management will apply every possible means and tactic to maintain and strengthen its subordination of labour (Mouzelis, 1967). Such activities involve putting in place hierarchical structures, highly specialised jobs requiring little skill (Burriss, 1989), and minimising worker involvement in the decision making process by introducing centralisation (Goldman and Van Houten, 1977). The mechanisation process enables management to centralise the organisational decision making process (Braverman, 1974; Morgan, 1986). For instance, Shaiken (1984, p. 05) stresses that "[Management's] desire to increase control over production... calls for transferring decision-making off the shop floor".

Furthermore, Braverman's approach elaborates that the division of the work force further strengthens the management's role/position (Shaiken, 1984). By dividing the role of workers

into small tasks, managers reduce their contribution, and thereby further solidify managerial dominance (Goldman and Van Houten, 1977; Shaiken, 1984; Noble, 1986; Burris, 1989). From the Marxist perspective, technological innovations only add to management's control over the way workers interact through the fragmentation of labour in levels, functions and jobs. Mechanisation of work processes support the capitalist's objective of "creating and emphasizing differences and institutional divisions among different kinds of workers . . . with unequal levels of privilege and opportunity... to fragment a labour force that might otherwise be united" (Morgan, 1986, p. 283). Dividing labour into specialised tasks thus reduces their bargaining leverage and eliminates the chances of resistance that can otherwise be posed if the work force is united (Shaiken, 1984).

Although Braverman's approach is useful in understanding the role of technology and its use by the organisational managers, his approach is also charged with neglecting the role of human agency. Just like Marx, he also downplays the workers' ability to resist management control, and in worst cases to indulge in the process of self-exploitation (Adler, 2007).

2.2.4 Burawoy's Labour Process Theory

Burawoy's approach to underpinning the complexities of the politics of production within factory regimes is of course not a pioneering one, and is greatly inspired by the work of Karl Marx (Greenberg, 1986). The linchpin of his analysis, just like Marx, is technology as an element to strengthen capitalist control, within what he calls factory regimes (Burawoy, 1992). Nonetheless, Burawoy's labour process theory, while still firmly grounded in Marx's work, provides a richer view and answers many of the limitations evident in both Marx and Braverman's approach (Adler, 2007). Firstly, unlike both Marx and Braverman, who present workers as helpless and powerless actors in the organisational setting, Burawoy uses Labour Process Theory (LPT) to highlight the dynamics of the labour process, organisation and management (Burawoy, 1983). In his work, he pays greater attention to the worker's struggle within an organisational context (Burawoy, 1979). He stresses that in the production process, the working class has to set the foundation for its own survival within the capitalist system. This is called the labour power that is measured through the value added in the production process by the workers that determines whether a worker can turn up the next day. Additionally, workers have to produce surplus in order to inflate the profit of capitalists, so that they continue to employ the workforce (Burawoy, 1992).

Secondly, he presents the notion of self-exploitation as opposed to the concept of ‘direct control’ (as presented in the account of Marx and Braverman) over the workers through the application of technology (Burawoy, 1979). Burawoy quotes his own example of working on manufacturing diesel engines in Chicago, where he actively worked as a machine operator. He shares his experience of being an active accomplice in his own exploitation by the managers (Burawoy, 1979). He asserts that workers in the machine shop did not develop solidarity, but instead considered their work as challenge where every worker wanted to ‘make out’. By making out he refers to the worker’s efforts to get a marginal increase in pay for each job performed and earning more than co-workers. He suggests that this activity created rivalry amongst co-workers, who were set against each other in order to compete for higher wages. This led to horizontal rivalries between co-workers and displaced the traditional vertical antagonism prevailing historically between workers and managers. Use of this example here illustrates that technology is not the only way to control the workforce, the workers can also engage in the process of self-exploitation, where managers divert the concentration/focus of workers from posing ‘resistance to managerial control’ towards the willing participation in ‘bargaining games’ (Burawoy, 1979).

In summary, Burawoy’s analysis focuses on the broader political and economic conditions surrounding the production process and how these structural conditions determine the interrelationship between the labour process and social relations at the workplace (Greenberg, 1986).

2.2.5 Techno-Political Approach

Winner’s (1980) work, is relevant here given its focus/emphasis on the idea that technologies and the process of their implementation/transfer is embedded in social relations, i.e., power. In this regard, Winner’s approach can be viewed as a ‘theoretical warrant’ against the notion that developments in technology and its implementation or transfer is totally unmediated by the outside pressures and is completely caused by the internal changes within organisational composition (Gagliardone, 2014). He suggests caution against any such view because these approaches tend to show that organisations choose particular technological forms solely to satisfy the needs/requirements of society. According to Winner, ‘those who have not recog-

nized the ways in which technologies are shaped by social and economic forces have not gotten very far' (1980: p. 122).

Winner suggests that technological artefacts can have political implications built into them in the way they are invented, established and designed (Gagliardone, 2014). These implications are then reflected in the ways these large technical systems are used to settle societal matters. Winner further suggests that in order to investigate whether the implementation of varying technological forms is politicised or not, one needs to explore different aspects of it, such as the development (design) process of technological artefacts and studying it in relation to all stakeholders associated with the development and implementation of technological forms (Winner, 1980).

Winner illustrates his argument that 'technological artefacts have political implications built into them' by narrating the case of construction of Moses' bridges on Long Island, New York, which were purposely built very low, thus only providing access to automobiles to pass under them, while restricting the passage for other vehicles such as buses. He states "Poor people and blacks, who normally used public transit, were kept off the roads because the twelve-foot buses could not get through the overpasses. One consequence was to limit access to Jones Beach, Moses's widely acclaimed public park" (Winner, 1980: p. 28). For Winner what is important here is not the discussion of technology itself 'but the social or economic context within which it is embedded' (1980: p. 122).

As evident from the above example, Winner's approach explores the politicised power relations and influences that facilitate the implementation of otherwise contesting and resisted technological forms in different geographical settings. Winner asserts that when the transfer of technologies is backed by power relations, the impact of these technologies on society as a whole is largely ignored (Gagliardone, 2014).

As stated by Gagliardone (2014), in contrast to the once existing naïve view that technologies are designed and implemented to satisfy the requirements of a company or society, the political implications of technology are now well known and 'being substantiated by empirical case studies that illustrate how [both the design and implementation] of technological innovations/change, particularly in developing countries, involves struggle and contest, and yet we see their (forced) adoption in these economies (Gagliardone, 2014: p. 03).

2.3 Issues Relating to Ontological Clarity

In the above section the focus of discussion was on the importance of context in performing organisational analysis in relation to technology. This review, while acknowledging the significance of context, simultaneously admits lack of emphasis placed on the ontological clarity within these perspectives. As a result of which these approaches present unclear accounts of technology, its material properties and affordances, the role of human agency, and distinctive properties possessed by the human actors. The purpose of this section is then to define approaches in relation to their ontological assumptions. For instance, although this review appreciates the Actor Network Theory's (ANT) focus on studying the networks of relationship, it remains sceptical about the flat ontology surrounding these discussions where human and non-human are treated as equivalent (Latour, 1987 & 2005). On the other hand, it discusses the Orlikowski's (1992) Gidden's (1984) inspired structuration that explains the duality of technology is problematic given its conflation of structure and agency. Lastly, this section deals with defining Mutch's socio-material approach (2010 & 2013), derived from Archer's realist morphogenetic perspective (1995). This aims to explore social structures and material artefacts as separate entities, while exploring the distinct properties of both technology and social structures, by underlining the relationship between both. This is followed by a discussion of selection of the socio-material approach for underpinning this research, which is based on careful consideration given to choosing a comprehensive tool kit that deals in greater detail with ontology, and at the same time is sympathetic towards concept of context (see for example Mutch, 2013). Especially, it recognizes that the question of power and culture has not been adequately dealt with in the analysis of organisation and technology (Mutch, 2008). As this research mainly borrows concepts from the Critical Realism (CR) tradition for the purpose of conceptual clarity, the attributes of CR (Bhaskar, 1975) and its engagement with socio-material theory is explored. Although CR is not a substantive theory on either organisation or technology - it plays an under-labouring (accessory) role in seeking to provide a more accurate description of the relationship between ontology and epistemology, thus providing researchers with a tool-box of analytical concepts and an architecture for understanding the social world (Mutch, 2005). It is for this reason that many researchers borrow concepts from CR philosophy to develop the domain specific theories both in natural and social sciences (Sayer, 1992). The selection of CR philosophy for the present research is argued on the basis that there are dimensions of Critical Realism (CR) that can illuminate socio-

material theory and thus provide utility for this research. This chapter extends the notion and argues that there are dimensions of compatibility between CR and socio-material theory which provide utility for the analysis of the social and material. Work by Alistair Mutch (2002, 2005, 2010 & 2013) is drawn on to delineate the ontological status of socio-material concepts.

In this section we will discuss each of these perspectives in detail along with their implications.

2.3.1 Actor Network Theory (ANT)

As discussed in the literature so far, with the early theories around technology and society being accused of over emphasising the impact of technology, the later body of work within this domain saw scholars making deliberate attempts to avoid being charged with technological determinism (Elder- Vass, 2008). As a result, scholars intentionally chose to understate the impact of technology on the social life both within and outside organisational boundaries (Leonradi & Barley, 2008). It is argued here that the popularity of ANT is partly due to its serious consideration of technology. Based on Latour's writings, ANT's characteristic move is its call for tracing 'networks of associations' in which 'actors' act (see for example 2005 for his updated commentary on ANT). ANT's strength lies in increasing the scope of activity of actors – a term that he uses widely to refer to both human and non-human actors. In his view, these actors together form the networks of association. Even in early theorisation of his work, Latour (1987) proposes that authors within the social science domain have deliberately focused on social (human) activity, and treated (non-human) material phenomena, such as technology, as irrelevant, hence setting a foundation for the exclusion of material from their discussion. In this way, ANT raises a valuable point for traditional sociologists that have not paid much attention to the influence of non-human agents/participants while focusing in their entirety on the role of human agents and social structures. This recognition of the role of non-human actors has actually benefited the studies of 'science and technology' which are continuously based around studying the relationship between humans and technology (Elder-Vass, 2008). The contribution of ANT is greatly appreciated, because non-human actors also possess causal power and add a great deal of explanatory value in determining the occurrence of events.

The second major contribution of ANT lies in its focus on the ‘network of associations’. The core essence of Latour’s argument is that humans and non-humans are embedded in networks that provide a rich set of insights into their deployment and operation. ‘Actors and technology exist in a network of aligned interests, and are equally engaged in trying to enrol allies into the network by translating their interests so they will be aligned’ (Strong et al., 2014; p. 56-57). He stresses that social analysts should join forces to examine the network’s dynamic relationships and ‘what emerges from these’ (instead of trying to draw a line between the human and technology). For Latour, society and whatever happens within it is a direct result of these networks, rather than a condition for their existence (Mutch, 2002). Indeed, there is a great deal of value in ANT’s demand for tracing the associations between actors, because we cannot give a full account of the workings of social structures until and unless we can explain how is it that these structures are produced by these associations (Elder-Vass, 2008; O’Mahoney et al., 2016).

That said, ANT has its own shortcomings – for ANT, whatever cannot be scientifically investigated/observed does not exist. Hence, for Actor Network theorists, the world is an outcome of scientific inquiry, thus it is science that creates realities (Latour, 2005; Law, 2004). Unlike constructionism, ANT doesn’t propose an outright denial of reality as prevailing ‘out there’ - it implies that human actions do not produce realities, insisting that realities are a result of ‘practices of science’. ANT, thereby, ‘fails to recognise the existence of mechanisms that are independent of and are anterior to scientific investigations; it often fails even to recognise the existence of actualities prior to their observation and description by professional observers’ (Elder-Vass, 2008, p. 471). In short, ANT has overemphasised the empirical domain in the description of events (O’Mahoney et al., 2016).

The second drawback of ANT is that it has no regard for the issue of agency (action) and structure (context), thereby presenting a flat ontology. ANT strongly asserts that structure adds no explanatory value in determining the occurrence of events. From a CR perspective (that will be discussed in detail in the later section of the chapter), both structure and human actors are entities with distinctive causal powers, and together they lead to the occurrence of actual events (Elder-Vass, 2008, p. 463). The CR approach, while admitting that social structures are a result of human activity, argues that these structures have emergent properties and cannot be reduced entirely to such activity. Indeed, structures such as organisations and institutions have the causal power to work in their own right. This causal power is activated only

when individuals are arranged in a hierarchical manner within these structural settings. Hence, individuals can only actualise their respective powers in accordance with their position within the structure. This then makes it clear that the power lies in the structure itself and not the human within this structural hierarchy. Moreover, individuals situated at higher levels of a structural arrangement will have more effective causal powers than those at lower levels of the structure. ANT therefore has no regard for the context in which the social activity occurs. As argued by Mutch, ‘there is no distinction of micro and macro, or local or global, or the many other dualisms that sociologists typically apply’ (2002: p. 483; O’Mahoney et al., 2016).

Thirdly, ANT is criticised for its treatment of ‘human and non-human ‘actors’ as equivalent’ (Leonardi, 2013). Latour (1987) argues that authors, proposing a distinction between the two, do so arbitrarily. Thus, once again, ANT suffers from its flat ontological base with no regard to human beings. For proponents of ANT, the human being is a purely social creation. This theorisation is directly at odds with the ‘stratified nature of human society’, as presented in Archer’s realist work that stresses ‘human beings although emerge from human society but are not reducible to, physical materiality. From human beings emerge social actors who operate in a terrain conditioned by emerging structures, but human beings are not to be reduced to either’ (Mutch, 2002: p. 485). This approach overlooks the power possessed by human beings and stresses that analysts should focus on the way in which technology works, in a similar pattern, as they would study the behaviour of human actors. In other words this approach is suggesting that just like technologies, human actors also cannot speak their own mind. Contrary to this, it is argued that while non-human actors (material things) cannot communicate because of their lack of ability to speak and express their point of view, human actors can choose not to speak for various reasons, but not due to lack of ability. It is this ontological status of things and humans that is not identified in the accounts of ANT.

2.3.2 Nicolini’s Eclecticism Based on ANT

Nicolini’s study of zooming in and out is important primarily because it focuses on implementation of an ES technology– telemedicine and the ways in which the nursing practices have evolved in the wake of this new technological system. Nicolini’s work (2009) focuses on telemonitoring – a technologically advanced ES that monitors and advises patients of Chronic Heart Failure (CHF) through telephone calls. The implementation of this telemoni-

toring system thus reduces wastage of organisational resources (hospital beds) and is an efficient means of caring for patients in the comfort of their own homes. Nicolini's (2009) work looks at organisational practices, their evolution, implementation, modification and transfer trans-locally in time and space, as enabled by the telemonitoring system. Nicolini, through study of the field of telemedicine, suggests that the practice of implementation, modification and transfer of the telemedicine system is enabled by networks/associations. According to Nicolini, this network of association, the field itself and the way they are connected presents an interesting 'object' of inquiry.

Nicolini's research bears similarities to this work in two main ways. Firstly, it also looks at different theoretical perspectives with a view to suggesting a more robust analytical framework based on these existing perspectives rather than introducing a new ground breaking research. Secondly, his idea of zooming in is presented along the same lines as this research which calls for closer engagement with phenomenon for better analysis, although Nicolini does so by changing theoretical lenses and pushing other objects of inquiry (context) to the background. That said, Nicolini's approach, albeit being unique due to its eclecticism, is limited in scope and has very little to say about social structures, institutions and their underlying power mechanisms.

In this work, the researcher puts aside the initial hostility that critical realists have towards ANT scholars, and acknowledges ANT's strength in placing importance on material artefacts, particularly at a time when scholars are seemingly reluctant to admit the significance of materiality given the stigma of determinism attached to it (Elder-Vass, 2008). That said, similar to other proponents of ANT, Nicolini's approach also overemphasises the role of telemonitoring technology in changing traditional work practices in hospitals, and has no regard for human actors (nurses) and how they differ from other non-human actors, including artefacts such as therapy sheets and the field of practice. In his work, Nicolini reduces human actors to having no conscious mind with which to decide for themselves. His work implies that human actors (both nurses and patients) will be engaged in implementing and later using these practices continuously, even when they are undesirable. This view is directly at odds with the realist account that implies human beings hold distinctive characteristics and causal powers that put them in a unique position, thereby differentiating them from non-humans (Archer 2000 & 2003).

2.3.3 Barad's Agential Realism

Barad's work builds upon the earlier work of Bohr, Foucault, and Butler to provide a nuanced argument that is based on epistemological footing, to define what is social and material. For Barad (1996) it is important to investigate how people get to know the reality of the universe. Barad stresses that technology and other modern tools are only apparatus that humans create in order to explore that reality. The baseline of Barad's argument is that it's actually people that construct reality and then attempt to present it to others (Barad, 1996).

In direct contrast to Actor Network Theorists Barad's work is convicted with agential realism that overstates the role of human agency (Leonardi, 2013). As opposed to the Actor Network theory, for Barad, 'objects or phenomena do not have agency; people attribute agency to them when they use equipment, machines, formulae and other various apparatus in an attempt to explain the machinations of the universe through the imposition of causality'. Barad situates her 'agential realism' on what she calls 'onto-epistemology' (Barad, 1998). Her approach thus 'combines an ontological commitment to treat phenomena as discursively constructed and with an epistemological stance that treats our knowledge about the natural world as something that is not only tied to but inextricably bound with the technologies we use to observe it' (Leonardi, 2013: p. 62). Agential realism, therefore, shows little evidence of recognising the causal powers or explanatory significance of non-human actors in the process of building powerful analysis.

Barad's work is located within the realms of science, far from the body of work that has inter-linked technology and organisation. Orlikowski's constitution of sociomateriality study develops, extends, and brings this philosophical discussion into the domain of organisational analysis. The next section will discuss in detail how Orlikowski places her analysis firmly within agential realism.

2.4 Sociomateriality versus Socio-Materiality

In this section we will be exploring the work of two authors: Orlikowski, and Mutch, and the differences in their approaches towards the study of social and material. We argue that a better understanding of both sociomateriality (Orlikowski's approach), as opposed to socio-material approach (Mutch's approach), requires some firm ontological foundation. Dominant scholars working on sociomateriality theory have used either agential realism or critical real-

ism to explain their analysis (Leonardi, 2013). Where Orlikowski's (2007, 2010) work can be predominantly seen as having its roots in the agential realism foundations, scholars including Archer (1995, 2000) and Mutch (2002, 2010 & 2013) have tried to locate their discussion of social and material within critical realism footings. Most of what we know about what is social and what is material within the organised body of literature can be associated with the work of Wanda Orlikowski (Orlikowski & Scott, 2008). Orlikowski's writings on the socio-material perspective are largely based on the work of science authors Latour (1987, 1992 & 2005) and Barad (1996, 2003 & 2007).

2.4.1 Orlikowski's Socio-materiality Inspired from Giddens's Structuration

Wanda Orlikowski's work on electronic communication technologies has sought to understand the relationship between organisation (social) and technology (material). Orlikowski's early work on sociomateriality (1992) focuses on understanding the 'duality of technology' within the organisational context. Early theorisation of her work is greatly inspired by Anthony Giddens's 'structuration approach' (1984). Giddens work says less about technology itself, instead emphasising the debates within social theory concerning structures and human agency. Giddens argument was that, while the structuralists place more emphasis on the structural arrangements and properties, others emphasise the individual choices available to human actors. These opposing camps remain in denial of either the power of structures or the set of choices available to human actors. Giddens argued that structure and human activity were interconnected, yet having their own powers and abilities to work in their own rights. This is to say that although enduring structures have the ability to constrain or enable a human action, 'without enduring structures no action would be possible' (Mutch, 2008: p. 75). On the other hand, human actors can design, perceive, shape, and at the same time restrict the use of structures such as specific work arrangements. Applying this structuralist view to her analysis, Orlikowski calls for the entanglement of social and material, as both reside together. According to her, by doing so, theorists can avoid being charged with either technical determinism or human determinism (Orlikowski, 2007). According to Orlikowski, all human day-to-day practices are sociomaterial in one way or another. Her main argument is that human and material objects are co-dependent in their existence. Hence, they do not possess any imminent characteristics and are limited to the shape, features and capabilities that arise as a result of this mutual dependence (Strong et al., 2014). A similar argument can be found in Latour's writing (2004; p. 83), which states that '[objects] do not exist in and of themselves'.

Orlikowski does pay attention to the technology, but simultaneously he implies that IT lacks the characteristics/ability to observe independently of its relationship with users.

The later body of Orlikowski's work, from 2000 onwards, focuses on technology and constituting structures applying a 'practice based view'. Orlikowski (2000) suggests that technology is neither invariable (it changes over time) nor are its characteristics well defined (users perceive them according to their experiences with technology within an organisational context). Hence, by calling for entanglement of the social and material, Orlikowski believes that focus can be shifted towards studying these organisational practices. To accomplish this, Orlikowski suggests a closer examination of practices that constitute repetitive human and technology interaction at the time when humans are engaged in using technology to perform routine operations. According to her, while practicing their routine operations, people shape the emergent and situated use of that technology. It is argued that Orlikowski has borrowed her focus on the 'practice' from Latour and Law's writings that emphasise the study of the 'network of relationships', while ignoring the separation of 'social' from 'material' or even rethinking the significance of material in organisational work practices. Orlikowski's work implies that, through their repetitive/routine enactment of technologies-in-practice, people either reproduce similar practices and comply with the structure, or choose to modify the practice, which thereby leads to 'structural transformation'. Through her empirical work on groupware technologies she identifies three different types of enactment, each being an outcome of varying conditions/practices in which humans and technology interact (Orlikowski, 2007). In the case of 'social inertia', human beings will continue to use familiar practices to accomplish their routine tasks and reproduce the structural conditions. Under the condition of 'application', human beings begin to use the same technology in different ways. This is followed by a change in the way practices are traditionally performed. This modification therefore impacts the role of relationships and, of course, the 'practice' itself. Under the third condition, 'social change', people will modify technology to better suit their work preferences/norms. Such a condition changes structures.

In her most recent writings, Orlikowski has focused on 'interpretive flexibility' and 'agential realism', concepts adapted from the work of Barad (Orlikowski, 2007). Orlikowski has focused on the ways in which new technologies have been employed and understood by users within organisations. The use (scope) of technology in her analysis specifies the material properties, whereas the role of technology is determined by the perception of its users (inter-

pretive flexibility). In the later series of her work, Orlikowski emphasises the role of human agency and downplays the material properties of technology. Her analysis proposes that technology is a dynamic factor that is shaped by the perception and actions of human actors' 'agential realism'. This view suggests that technology or technological change cannot occur independently of human actors where a group of people, notably those with power and politics, shape and reshape the processes/ways in which technology can be used. Different people or different groups can interpret and associate different meanings to the same technology based on their personal experiences (Weick, 1995). The human actors with ability (power) will use their personal experiences to enact technology or resist it to serve their own interest. For example, if the implementation of any technology within the work place is perceived to bring a big change to the traditional working patterns, there is a greater chance of resistance towards that technology. On the other hand, if workers are convinced (through direct involvement or training) that technology will support their work practices and help them to accomplish their tasks easily, there is greater chance for acceptance of the technology. The technology fails/ is resisted within organisations when it ignores the needs of its users, or if there is no consensus among workers about the use of technology because there is a diversity of users who will be affected by it. This view underplays the fact that material properties of the technology can also constrain or enable its use in different contexts. This is to say that physical attributes of any technology shape the ways in which it can be used. For example, the architectural design and physical properties of certain technological forms constrains the use of certain software on them. Whereas the very reason that organisations still adopt these technologies is because they enable many functions that facilitate the improvement of routine work processes within an organisation.

2.4.2 Critique of Orlikowski's Sociomateriality Theory as Grounded in Agential Realism

Although this review appreciates the attempt of sociomaterial theorists to include the otherwise leftover, material phenomena in the discussion on organisation and technology, it warns against over reliance on agential realism upon which most current discussions of sociomateriality are constructed. Concerns over the dependence on agential realism to underpin the social and material aspects of an event are summarised in Table 2.1. and discussed in detail below.

Table 2.1: Problems for Sociomateriality Arising from Agential Realism.

Problems arising from the adoption of 'agential realism'	Reasons why problems exist	Solutions to problems from the adoption of 'critical realism'	Reasons why problems are avoided with 'critical realism'
Lack of explanatory power (of empirical phenomena).	Conflation of realms of action and structures precludes an examination of 'becoming' and shifts the focus to what 'is', which leads to descriptive studies.	Treating materiality as existing in the realm of structure and social action as existing in the realm of action.	Use of an analytical dualism between structure and action.
Inability to perform empirical studies that actually demonstrate 'sociomateriality'.	Empirical operationalization forces scholars to define, at least implicitly, what is 'material' in the context they are studying, which decouples a phenomenon that would otherwise be 'sociomaterial'.	Shifts focus of explanation from what things are to why they appear to be as they are.	Ontological separation of 'social' from 'material' accords with actors' categorization with and experience of phenomena.
Overlooks how practices are sustained and changed.	Absence of a theory of temporality due to conflation of social and material.	Specifies mechanisms that link action and institution (social and material) over time.	Includes an explicit theory of temporality.
Treats all relations as mutually constitutive or co-dependent.	Reliance on a thesis of 'interpenetration' and a conceptualization of the social and the material as internal relations.	Examines how the 'social' and the 'material' become constitutively entangled to produce the 'sociomaterial'.	Employs a theory of morphogenesis to argue that materiality, as a 'structural' property, pre-exists action - people's use of a technology.

Source: Taken from Leonardi, 2013.

In this review, we argue that it is not clear how sociomateriality, having agential realism footings, is being termed as a novel approach (Mutch, 2013). This argument is further strengthened (as can be seen in this review) by the fact that most of the findings of sociomateriality

are in line with ANT. Moreover, even the STS approach generates identical insight, but off course, and without deep philosophical foundation backing up such analysis.

Another argument, worth discussing is that the blurring distinction between social and material as presented in agential realism invites a great deal of trouble for researchers trying to explain their empirical findings from a socio-material perspective (Mutch, 2013). This trouble is evident in the work of Wagner, Newell & Piccolo (2010), as they voice their difficulty defining their data set: ‘we found it quite challenging to keep the material in the story line without falling from one side to another, either leaving the material realm unexamined, or emphasizing the agency of material at the determinant of understanding the entangled practice’ (p. 292-293). In other words, the claim about hammer being material is easily justifiable as opposed to claims about it being social in any way (Leonardi, 2013).

We also stress that the inadequacy of agential realism to deal with the notion of time is problematic. Organisations and human actions both exist in time, and without taking time in account, it is hard to explain why practices get initiated, endure, modify, or are even lost. For instance, Archer’s work on the transformation of societies covers such a long span of time. Not only Archer’s work, but this theorisation is directly at odds with other theories like neo-institutionalisation (DiMaggio & Powell, 1983), emphasising the endurance of practices in organisational settings requiring time and space (Leonardi, 2013).

2.4.3 Archer’s Structure- Agency Debate (Morphogenetics)

Archer’s morphogenetic approach provides enriched insight on understanding the use of IS (Information Systems) by societies. As opposed to conflationism, adopted as a solution for the dualism of structure and agency, in the accounts of Latour, Giddens and Orlikowski, Archer’s (1995 & 2000) work, located within the realms of realist philosophy, proposes analytical dualism in order to better conceptualise the relationship between agency and structure. In developing her work, she borrows concepts from CR philosophy. A key preposition of her work is to investigate the interaction between structure and agency given the cultural context over a large span of time. In doing so, Archer is concerned with the emergent properties of structures, wider context that surrounds both structure and agency, and mechanisms that generate sets of actions, all of which are arguably taken from CR philosophy. Now, we turn our

discussion towards detailed discussion of these complementing features of morphogenetics and the CR perspective.

A key feature of Archer's morphogenetics approach lies in her treatment of structure and agency as separate entities. Archer asserts that Giddens work combines the concepts of structure and agency so much so that they seem to be entangled (Mutch, 2013). The same approach is evident in Orlikowski's work that stresses, 'entities (whether humans or technologies) have no inherent properties, but acquire form, attributes, and capabilities through their interpenetration. This is a relational ontology that presumes the social and the material are inherently inseparable' (Orlikowski and Scott, 2008, p. 455). The sociomateriality theory, as defined in Orlikowski's writings, states that 'there is no social that is not material and no material that is not social' (2007: p. 1437). Archer argues that such theorisation does not leave much room for their separate development in time or to analyse their relationship (Mutch, 2013). Her argument is that Orlikowski's view, that social and material systems are so intertwined they cannot be separated, is not a true representation of the relationship of the two systems. And this is to say that sometimes one form becomes dominant over the other. For example, technological determinism vs social construction of technology - human determinism. Archer stresses that there are other approaches as well that view them as two interacting systems (for example, socio-technical systems theory). Archer's (1995) work based on critical realism 'suggests that technology can possess material properties independent of users perception of them (Mutch, 2008: p. 79). Archer's argument, therefore, is that considering social structures and material characteristics of a phenomena as intertwined is integrally self-contradictory, because we cannot discuss humans and technologies separately if they are inherently inseparable. According to Archer, Orlikowski's sociomateriality marginalises the significance of two distinct but interacting structures by embedding them in 'duality' that loses sight of both its components.

Archer on the other hand argues that 'structure logically predates the actions that transform it, and structural reproduction/reinforcement logically postdates those actions' (Leonardi, 2013: p. 68). This approach proposes analytical dualism, where the structure and agency (events occurring as a result of interplay between structure and action) are seen as interacting phenomena that are in no way identical/interlinked (Archer, 1995). It is argued that Archer's morphogenetics, as built upon critical realism philosophy, thus offers structures to be studied independently from the action responsible for their existence and reproduction over time.

Archer, adopting a critical realist perspective, proposes stratification to investigate levels of material (technology). For instance, the hardware level of a technology determines the software level, i.e. what software program can be installed on the hardware (Mutch, 2008: p. 79). Additionally, the architectural design at the hardware level can both limit and facilitate other technologies being configured with it. For example, software programs are written in different languages such as Java, C, C++. As a general observation, programs written in Java are mostly compatible with hardware designs of many technologies, whereas, programs written in C or C++ might require specific configurational settings in order to be installed on computers.

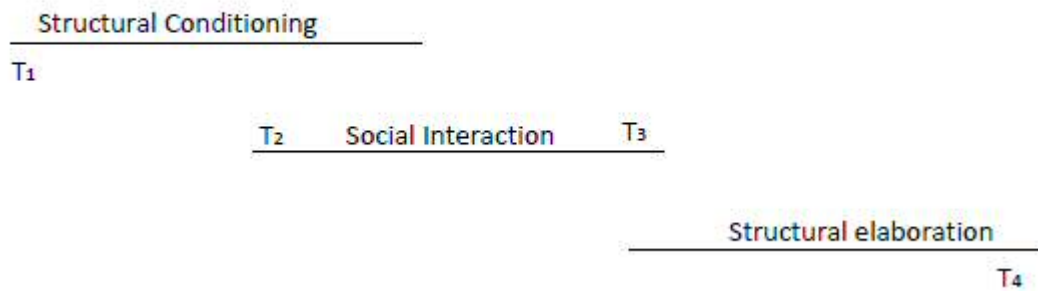
Secondly, time is of central focus in Archer's analysis. In her work, Archer extensively focuses on time to observe how structures are reinforced and changed. This notion of time and space is in line with the CR philosophy that focuses on the emergent nature of social action from structures and how they are constrained or endured over large sweeps of time. Most of Archer's earlier writings focus extensively on the cultural context of social analysis, which is complemented by the selection of CR philosophy that gives importance to the study of broader structures. Archer contends that disaggregating structures and agency helps in uncovering their relationship over time. Time is important here, because structures endure, reproduce themselves and acquire new features or 'emergent properties' over time.

Archer uses the concepts of analytical dualism in her studies to explore the pattern of changes occurring over a long period of time at the macro level in areas like education, religion and science (Mutch, 2010). Her work (1979) on development of/advancements in educational systems covers a large span of time (300 years) summarised in 800 pages. Her work, although primarily based in the domain of sociology and social theory, provides insights in understanding that the changes in organisation (especially those relating to technology) are linked to changes in broader political and economic structures (Mutch, 2005). Archer stresses that such analysis can be equally useful to gain understanding of smaller problems (Archer, 1996: p. 228). Given this, using her work to examine the use of information systems in different organisational settings can be useful (Mutch, 2013).

2.4.4 Archer's Morphogenetic Cycle

Archer has summarised and elaborated her concerns with the concept of conflationism through a 'morphogenetic cycle' that is reproduced here in figure 2.1, and discussed in detail.

Figure 2.1 : Archer's Morphogenetic Cycle



Source: Reproduced by author.

Archer argues that proponents of structuration, structuralists, in their discussions, never go beyond the T2 point, as they assume certain structures will impose conditions on the ways social interaction will take place. She terms this 'downward conflationism'. In such conditions, social action is a result of structural conditions. She further argues that, in contrast, there are other accounts that see structures as solely dependent on individual actions. For her, these accounts do not consider any pre-steps to the T2 point. That is, they remain in denial of conditions that structures can impose on social action. Archer also points out the existence of another category, central conflationism, that elides/omits any differences between structure and agency. Giddens's work that is later followed by the likes of Orlikowski and Walsham falls under this central conflationism that revolves around point T2 and T3, where social interaction is more important than the debate of structure and agency.

Point T4 'social elaboration', in her cycle 'has been concerned, in the spirit of critical realism, with uncovering the mechanisms that bring humans into collision with the structures that other humans have created, and that both constrain and enable their action' (Mutch, 2010: p. 509). Although this view suggests that structures are reliant upon human interaction (social action), but not essentially upon the human beings of the present age. For example, structures such as language were created long ago by the people of past, and left to us as a context that

shapes human action in the present age. So, for us these structures (e.g. institutions, rules, roles and responsibilities) pre-exist the human action. To clarify this, I will use Sayer's (1992) example of what he calls 'the institution of rent', that, according to him, bounds home owner and tenant in a relationship. The structure in this example, is defined as the roles and responsibilities of both parties. This interrelationship requires the home owner, on one hand, to maintain the property and facilitate the tenant (social action, constrain), and requires the tenant to pay the rent on time (social action, constrain). Although their relationship requires them to perform a social action in the way mentioned above, the tenant can opt out of paying rent at some point in time, but this can cause conflict with wider structures. Now, if the tenant chooses not to pay rent, and enter in what I call a social action of contradiction (point T4, structural elaboration in Archer's morphogenetics cycle), this can make space for social change. However, this social action of contradiction is also constrained by legal regulations such as a tenancy agreement. A tenant can choose to reinforce and thereby reproduce the structure by abiding with a legal contract by paying the rent on time. In this situation the social action of 'reproducing structure' is more enduring and likely to recur as opposed to the social action of contradiction. Hence structures impose the conditions but cannot determine the social action. Structural elaboration is thus important to understand the change in social action that leads to change in relationship between the elements/parts of structure. This concept of structural elaboration contradicts Giddens's ontological claims about structure that portray it as a weak entity consisting of rules and resources that are presented only through social action, thus leading to conflationism of structure and agency. From the above example it can be understood that although structures are determined by social actions, they are not weak, they also have the ability to constrain human action.

2.4.5 Mutch's Realist Socio-Material Approach

As discussed above, Archer's work, although of great value, has been developed within the social theory domain and focuses on societies that undergo transformation over a long span of time; it says less about organisations or technology itself (Mutch, 2005). Mutch is a strong proponent of Archer's work and her selection of critical realism philosophy in the study of the social world. Alistair Mutch, therefore, uses dimensions of morphogenetics in the discussion of material (structure) and social (agency) within the study of organisation and technology. The point of agreement between Archer and Mutch's approach lies in their interpretation of social and material as two distinct entities that are interlinked and presented as entangled entities through the agency of human actions.

Mutch stresses that use of the CR perspective in the study of social theory by the sociologist Margaret Archer is valuable, as it specifies both the importance of structures and differentiates them from the activities of agents (Mutch, 2005: p. 61). As we shall discuss in the methodology chapter, the realist tradition provides a well-versed account that is interested in both structure and agency for purposes of a comprehensive analysis. The work of two prominent realists, Archer (1995) and Bhaskar (1989), famously known as the ‘morphogenetic cycle’ and ‘transformational model of social activity’ is based on two principles, respectively; structural movement and agential movement. Structural movement looks at how human action is attributed to the causal powers of the structure, despite not being completely dependent on it. The agential movement, on the other hand, entails how the action of a human determines, reproduces and/or modifies the structure to fulfil their own interests. Resultantly, critical realists propose an account where human actors, social structures and all other entities possess causal powers to work in their own right, and these entities collectively interact to produce social outcomes (Elder-Vass, 2008).

Mutch proposes the CR philosophy as a viable option for defining socio-material phenomena (2002, 2010, & 2013). CR tradition has been criticised for its over emphasis on agency (represented and understood exclusively as human) and ‘the invisible domain of the real (e.g. social structures) at the expense of the empirical, the material and the non-human’ (Reeves, 2011, as seen in O’ Mahoney et al., 2016, p. 5). Mutch’s approach acknowledges and addresses this shortcoming of the CR tradition. Mutch (2002) and other realists (Elder-Vass, 2008; O’ Mahoney et al., 2016) have called for the inclusion of non-humans in the discussion of organisations and society (Mutch, 2002). Mutch builds his socio-material approach on the concept of two types of agency, human and material. Mutch uses this ‘technology aware’ CR perspective in his socio-material theory, and contributes to the analysis of technology and society in four main ways, all of which will be discussed in detail below.

1. It suggests, although technology is not a structure in its own right, and is a result of social interaction, once it is shaped by human actors it imposes certain conditions for the exercise of human action.
2. Technology has material properties, and we can gain a better understanding of them only when we decompose technology into levels and features.

3. Mutch argues that these material aspects of technology by no means imply that people cannot have their own perceptions about the use and impact of technology and ‘interpretive flexibility.’ A key feature of Mutch’s analysis is to study the relationship between the material aspects of technology and interpretive flexibility of the human actors.

4. Finally, he proposes that human perception of these material properties is shaped by their interaction/experience with different technological forms and the broader cultural context that surrounds these technologies.

Arguing that technology is not a structure puts forward that technology is not a natural phenomena. It is both emergent and dynamic. The emergence of different technologies is determined by social interaction. The broader structure, say for example, market competition, determines which technological forms are needed over others. Once clear about which technology to develop, the system builders decide on how to design, and more importantly, how to customise the development of technologies to suit specific requirements of the client organisation. For example, the development of SAP- ISU, whose components are especially designed for companies serving in the utility sector, a discussion to which we will return to in Chapter 5. For now, our argument is that once the technologies are put to use, then, over a period of time, they acquire a degree of embeddedness within an organisational context. This is because, despite all their weaknesses, such systems purport assumptions about their impact as a means of increasing operational efficiency of the organisation. Of course, we must not forget the role of organisational managers, especially in deciding which technologies to implement, based on their personal interests, e.g. need for power, recognition, rewards etc.

Mutch builds on Hutchby’s (2001) argument that materiality does not just refer to physical attributes of technology. Materiality also points to the form that technologies will take in organisational settings. The very notion that different technological forms will have different implications on organisational arrangements is less explored in Archer’s work (Mutch, 2010). This view suggests that architectural design of technologies is equally important to understand. The way in which both hardware and software components are grouped together in a technological design, determines what functions can be performed by that technology. This is to say that different combinations of the same components of hardware and software can lead to different operational outcomes. Hence our analysis of technology should also explore the properties that emerge as a result of how different levels of technology are combined and put to organisational use (Clark et al., 1988).

Secondly, as mentioned earlier, material properties of technologies can impose certain conditions on their usage by the end users, and a better understanding of these constraints can only be obtained if we decompose technology into levels and features (Orlikowski & Lacocono, 2001). We reiterate, what is said before, that technologies are dynamic and therefore subject to change, but different levels of technological forms are effected differently by this change. For example, software level allows greater user involvement and is generally more amenable to change by its end users. On the other hand, different components of hardware, once installed, may prove difficult to change.

Mutch (2010) further argues that studies, including that of Archer, have placed less emphasis on the concept of interpretive flexibility. To fill this void he borrows the concept of interpretive flexibility of technology from Orlikowski's approach (2000), and stresses that application of such concept to the studies of technology and society can be of great help (Mutch, 2010). From authors following the critical realist tradition, Lawson (2007: p. 42) has attempted to do so by arguing that different technological forms, such as a CD player, come with a manual that provides detailed information about the company that designed it, and works as a step-by-step guide for users on how to operate it. According to him, such features of technology impose conditions on users, implying that they can use technology only as per the instructions given to them. For Mutch, these studies downplay the concept of interpretive flexibility. Mutch argues that there are technological forms whose use is not always clear to their users, and users actually put in a lot of effort to understand these technologies. Not only that, but many technological forms allow users to customise its components, at both the hardware and software level, to suit their preferences and fulfil their requirements (Mutch, 2010).

Mutch extends on the idea of 'reflexivity' developed by Archer (2007) in her most recent writings. According to Mutch (2010), when humans interact with technological artefacts, they gain experience. Later on, as a reaction to that experience, human actors build their perceptions about the technology. This process is what he terms reflexivity (2005). Archer, asserts that an individual's perception and ideas are almost always biased, and this is reflected through their thoughts as presented in their work (Archer, 2007). According to Archer, humans have the tendency to develop different modes of reflexivity that are shaped by the conflation of structural and cultural elements/experiences acquired over time and space.

As discussed above in explaining the contents of socio-material approach, the implication of ideas taken from critical realism is of great help in understanding the black box of technologies, as it plays an under-labourer (accessory) role in defining concepts like materiality, stratification, emergence, reflexivity, context, time and space.

Table 2.2: Differences between Structuration Perspective, ANT, and Socio-Material Approach

Structuration Perspective Agential Realism	ANT theory	Morphogenetics Critical Realism	Socio-material Approach Critical Realism
Focus on epistemology	Focus on epistemology	Focus on ontology	Focus on ontology
Compression of time and space	Compression of time and space	Time and space central focus	Time and space central focus
Conflation of social and material	Conflation of human and non-human actor	Analytical dualism	Separation of structure and agency (both human and material)
Focus on entanglement of social and material	Focus on networks not the interactions	Focus on Interrelationships between wider structures and agency	Focus on Interrelationships between wider structures and agency
Material aspects of technology and interpretive flexibility highlighted	-----	-----	Material aspects of technology, its affordances and interpretive flexibility highlighted
-----	-----	Emergent properties of technology and reflexivity	Emergent properties of technology and reflexivity

Source: Compiled by the author

2.5 Conclusion to Mutch's CR Based Socio-material Approach

The CR philosophy has been used to underpin wide ranging areas in natural and social sciences (Sayer, 1992; Ackroyd and Fleetwood, 2000 & 2004). As discussed in this chapter, when CR is applied to different perspectives on the social world and to the use of technology by social actors, it provides a better understanding of the relationship between information systems and the world (Mutch, 2013). In this section it is argued that the ideas drawn from CR can be of great use in explaining the engagement between the social and the technological.

In this regard, the socio-material approach, of late, has been one of the influential approaches in the study of the use of information technology by organisations. As discussed in detail in the literature review chapter, the socio-material approach, associated with the work of Alistair Mutch (2002, 2005, 2010 & 2013) is derived from the work of the sociologist, Archer, who uses the CR perspective for the analysis of the social and the material, as it is useful in many ways. Firstly, it separates the social (especially human agency) from the material (structure), thus allowing a better conceptualisation of the relationship between the two. The socio-material approach thus 'suggests ways of linking organisational changes, especially those involving technology, to wider economic and political structures' (Mutch, 2010: p. 507). This approach highlights the separate nature of the social and the material, a concept that the literature review chapter clarifies in detail in an attempt to explore the relationship between the two. This type of analytical dualism, that calls for separate analysis of structure and agency, is directly at odds with Orlikowski's (2007) technological dualism that stresses that the social and the material co-exist (none can exist without the other). Secondly, following morphogenetics, socio-material approach also calls for consideration of the material aspects of technology in detail. This can be done by applying the concept of stratification and emergence to differing technological forms, as developed in the CR perspective. That is to say that material properties of technology can be best understood if we disaggregate the components of technology into levels, i.e. the software and hardware level, and then separately analyse their distinctive properties/features with the intention of exploring the relationship of technologies with broader structural conditions, such as politics and power. Similarly, to perform the analysis of the social, it is important to decompose the social construction of a society into different levels of social class to identify their unique characteristics. Lastly, just like realism,

the socio-material approach also aims to underpin the causes/mechanisms that generate certain actions within the context of information systems, organisation and society.

In writing this thesis, a major and deliberate act has been the use of a hyphen in between “socio-material”, to highlight the researcher’s position as a critical realist as opposed to most of the proponents of the actor network theory or Giddens’ structuration perspective (that place a strong emphasis on actions embedded in networks). By doing so, the author, following this tradition, emphasises that although the interplay of social and technical actions need to be analysed in connection with each other for a better understanding of these concepts, they still remain separate entities (Mutch, 2013).

2.6 Affordances of Technology: Moving beyond Interpretive Flexibility

The concept of ‘emergence’, as described in the CR tradition, helps understand that although technology is designed by the actions of humans, once built, it has its own emergent properties that cannot be entirely reduced to its usage by different groups of people. This clarity on the role and scope of technology then enables us to move beyond the discussion of ‘social dynamics’, such as interpretive flexibility of technology, towards the more important question of what opportunities technology offers its user groups to accomplish something (affordances), what user actions it restricts (constraints), and how these user groups then respond to/work around these limitations (Volkoff and Strong, 2013).

The concept of affordances for the underpinning of technology and organisational debate is relatively new (Strong et al., 2014). The term ‘affordances’ was originally borrowed from the work of Gibson (1986) in the field of evolutionary psychology. Gibson’s work focuses on how animals comprehend the environment they live in. According to him, animals do not pay attention to the specific characteristics of an object, they are simply interested in what these objects allow them to do (Bygstad et al., 2016). Gibson (1986) presents an affordance as a ‘possibility for action’. ‘Affordances’ was later used by Norman (1988) in the field of IS to describe work on human /computer interaction (Strong et al, 2014; p.55). Norman’s work refers to ‘affordances’ as how an actor perceives an object and its utility. He later clarified how he wished to have used the term ‘perceived affordances’ from the beginning, as he was interested in knowing the actor’s understanding of the utility of an object.

This thesis uses the concept of affordances as presented in the work of Gibson to refer to an action possibility undertaken to achieve certain outcomes, where the action is a result of interrelationship between technology and human (Bygstad et al., 2016). The concept of affordances includes both the utility of technology as well as its constraints, thus requires an investigation of ‘what specific material features people use, why they use them and how and why their patterns of use shift over time’ (Leonardi & Barley, 2008; p. 163). For example, technological innovations enable users to perform traditional tasks in a way that has never been previously attempted. Hence, it is safe to assume (without being labelled as deterministic) that material properties of technologies do impact the traditional work arrangement. The fact that technologies have the tendency to resist or facilitate human action does not imply that ‘users are at the mercy of technology’, but suggests that users must work around these technologies accordingly. This is to say that technologies impose conditions on their usage, but only because they are built that way, however, technological designs can be changed/modified. Humans have the ability to willingly change the social impact of technology by altering or rebuilding it, or declining to use it (Leonardi & Barley, 2008).

The idea of affordances can be better understood by looking at the relationship between technology and humans in ‘use case scenarios’ (Bygstad et al., 2016; p. 86). It is argued here that material properties of technologies will change once they enter the ‘context of use’. As the technologies go through various stages of development, users will modify the material characteristics of technology to better serve their own agenda and interest. This interdependence of technology on human actors (including designers, engineers and users) then helps understand why similar technologies provide different results in different contexts.

The idea of constraints and affordances of technology may initially seem difficult to grasp, given the fact that technology is a product of human action (although not of users). Barley’s (1990) study provides a useful explanation for how constraints and affordances of technology are actualised. Barley’s study, located in the hospital context, reveals that due to the necessity of following information as it was displayed on a computer screen, radiologists were forced to give authority to sonographers while simultaneously promoting the idea of gaining experience in interpreting the sonograms. Although this meant a visible shift in the relationships typically existent between radiologists and technologists – the radiologists agreed to this shift in pattern mainly because in the case of non-adherence, radiologists would be required to conduct the examinations themselves. Thus, the material properties of technol-

ogy as part of its design constrained the activity of radiologists while offering certain affordances for its use by the sonographers.

2.7 Enterprise Systems Studies of Affordances of Technology

Researchers have, of late, presented empirical accounts of ES (Enterprise System) implementation within an organisational context to highlight materiality and affordances of technology. Early work by Elmes, Strong & Volkoff (2005), based on the longitudinal case study method, observes the implementation of SAP/R3, an ES, at ACRO, a multinational producer of industrial products, located in the north east US. They do not mention the term ‘affordances of technology’ in the paper, yet they emphasise the significance/role of technology by explaining how the SAP system simultaneously empowered and controlled the workers, leading to contradictory worker experiences with SAP. Volkoff, Strong and Elmes (2007) later use the same SAP case study to illustrate how this ES was actually employed by ACRO to integrate the business activities of all its plants situated across the world. SAP, a comprehensive commercial software package based on a common database, integrates business processes (finance, production planning, sales order management, material management, maintenance & repair operations and R&D) across ACRO’s plants, spread transnationally (2007, P.833). Their study focuses on how SAP, through the application of concept of embeddedness, enables change at an organisational level by causing organisational elements such as routines, processes, communication and roles, to change. The work of Volkoff and colleagues is valuable as it highlights the importance of technology, but only their most recent work (Volkoff & Strong, 2013; Strong et al., 2014; Bygstad et al., 2016) capitalises on the concept of affordances. Volkoff and Strong (2013), and Bygstad et al. (2016), introduce the idea of affordances and present it along the same lines as ‘generative mechanisms’ – a concept derived from the CR tradition, to help understand the underlying causal process that facilitates technology enabled organisational change. Through their affordance based theory of technology enabled organisational change, they argue that affordances are active at, in terms of critical realism, what is known as the domain of real, and provide possibilities for action. Moreover, similar to generative mechanisms, they exist irrespective of whether they are noticed or not. In a recent study, Strong et al. (2014) explore the usage of EHR (Electronic Health Records) enterprise system by a multi-site medical group with 25 sites located across the northeastern US. They focus on how EHR enabled integration, helped physicians to access patient records, and centralised the communication process between physicians and staff across all the medical sites. We reiterate what has been said before, that, despite their series of work emphasis-

ing the role of technology in the organisational change process, their analysis remains focused within organisational boundaries. Even when Strong et al. (2014) look at the use of EHR at both the micro (users, both staff and physicians) and macro (the field of healthcare) level, they do not look at how patients are affected by the EHR system.

Leonardi's work (2007, 2009 & 2011) on the software package 'Crash Lab', used by the Autoworks company, explores the process through which engineers assess the crash worthiness of their vehicles. As opposed to focusing on large scale ERP implementations, as seen in the work of Volkoff and colleagues, Leonardi focuses on custom built software that's use is highly recommended but not mandatory. Nonetheless, Leonardi has focused on different aspects of human-technology interaction, including interpretive flexibility, materiality and affordances of technology. Leonardi's (2007) study of the design and application of 'crash lab' software by performance engineers highlights the interpretive flexibility of technology. His work implies that if users perceive constraints of technology they will try to modify its material aspects to serve their own agenda. For instance, during the development process, the software came in contact with various groups, including 'research and development engineers, design engineers, implementers, engineering management and a variety of vendors'. Upon its physical encounter with each group, the modelling software's material features were constantly changed in order to fulfil the underlying motives of a respective group. Leonardi's later work (2009 & 2011) that utilises the same Crash Lab software, further suggests that if users perceive affordances of technology they will be willing to change their routines. The Crash Lab software offered affordances to the engineers by eliminating the time they traditionally spent on manually testing the crashworthiness of vehicles. Additionally, its 'standardisation affordance' sped up the manufacturing by outlining the step wise process that engineers had to follow. The software also helped engineers to actualise 'communication affordance', as they could easily interact and consult between themselves and help each other on various tasks. Although, Leonardi's work on Crash Lab, and Volkoff and colleagues study of the EHR and SAP system explores how technology offers different affordances to different user groups and puts limitations on its use by different user groups, their studies once again remain focused within the organisational context. What's missing in these accounts is discussion of the differential impact of similar enterprise systems (such as SAP) when put in practice in different countries and actualised in various socio-political contexts.

Another overlooked aspect of technology is the varying outcomes that similar technologies can produce. Mazmanian's (2013) paper explores the usage of mobile communication technologies by two groups within the same organisation. Her case study, a shoe manufacturing company, introduced the use of e-mail enabled mobile devices by its employees. She explores how every individual has a unique experience and will act differently towards technology (p. 1226), thereby producing different outcomes of the same technology within the same organisation. Mazmanian's work looks at the differences in perceptions of both user groups regarding the technology that enabled them to choose different communication practices. Where one group thought of mobile enabled e-mail devices as a trap of constant connectivity and an organisational means of applying social control, the other group perceived it as a useful and efficient mode of communication that provided extended access to work related e-mails. Her findings suggest that user groups experiences with the device (Blackberry) were vastly different.

The strength of Mazmanian's analysis is in identifying that technologies can produce varying results when enacted in different ways. That said, her analysis is situated within an organisational context and overlooks wider contextual forces such as national institutions and supra-national bodies and the power practices of these entities as facilitated by the structural setting in which they are operating, and how the interplay of these entities and their situated context enables as well as restricts outcomes among different user groups in various geographical settings, not only within organisational boundaries. Mazmanian's analysis focuses on different means of communication as adopted by members of both groups and how this practice of communication eventually leads to differential outcomes of technology, and says less about how different outcomes can be achieved through the deliberate misuse of technology by the organisation utilising it.

This review implies that despite the adaption of the concept of affordances by recent influential studies of IS, researchers have typically shied away from focusing their analysis on the affordances or constraints of technology, and concentrated primarily on human correspondence around the technology, even when the point of interest for the research is technology. Due to this, the concept of affordances and constraints of technology, despite having a great deal of value, is not yet fully developed and is, empirically, under investigated (Bygstad et al., 2016). Although a small fraction of studies have looked at the affordances of technology within the organisational context, there is still a need to develop studies that demonstrate

how, why and under what conditions technologies offer different affordances for their use when actualised in different socio-economic contexts. This will then help in exploring and thereby understanding how identical technologies offer different affordances for their use when implemented in developing countries. It is noted from the field data that in the absence of a powerful governing mechanism and accountability, the technology allows its users to do much more than would be possible under the conditions of a governing authority.

2.8 Conclusion

Whilst the early Marxist perspectives of technology and organisation, have tended to focus on wider social structures e.g. social class, traditional work arrangements, economy, politics, and how technology simultaneously effected and was effected by these social and economic structures, the later body of work has simply transposed the discussion of wider context and social structures into the discussion of technology within organisational boundaries (Leonardi, 2013: p. 62). This gap becomes even more evident in the literature, as the dominant theories around the organisation and technology in recent times, including STS, morphogenetics and sociomateriality, have explored the interplay of technology in relation to the structures of organisation and not with the wider economic-political structures. This review reiterates that the scope of context, as outlined in the work of Karl Marx (1964), and its proponents should not be reduced to organisational boundaries. It is argued that the inclusion of a wider economic context can help in identifying the role of macro-economic actors (The IMF and World Bank) in the interplay of organisations, technology and human agency. This will in turn help us understand how the involvement of these powerful actors in matters such as state-level policy making, shape organisational activity on a broader level.

Secondly, scholars have by and large presented a polarised account of technology within organisational literature. One extreme suggests that technology is user (those that operate it) dependent, and if it fails to meet user expectations and fulfil their agendas it is resisted or restricted because users have ‘agency’ (agential realism). On the other hand, technology has been portrayed as a powerful tool that controls the structural choices of organisations and how people will work around it (technological determinism). What has been overlooked in these accounts is a balanced discussion of technology and organisation. We suggest that current research would benefit from a non-deterministic multi-layered framework that allows researchers to link their discussions of technology and organisation with the concepts of hu-

man agency, structures, potential powers and, most importantly, with the society that is both directly and indirectly affected by the organisation's choice/use of technologies. This will in turn help explain why technologies can be successful at an organisational level (even if only apparently) among management and employees, yet be rejected by societal groups.

Thirdly, this review, while acknowledging the role of technology in organisation studies, suggests that IS scholars should engage further with the emerging concept of 'affordances of technology' to explain how technology both enables and disables its usage by different user groups. We suggest that the concept of affordances has a great deal of value in helping understand how and why similar technologies lead to varying outcomes when implemented within varying contexts. This study, therefore, calls for the development of empirical as well as theoretical accounts that can explain the differential impact of homogenous technologies when implemented in different time, space, and geographical settings.

In response to filling this void, this thesis borrows conceptual clarity from the CR perspective and builds on the notion of stratification and emergence. Applying the concept of stratification, this work calls for inclusion of social structures of social class in the discussion of organisation and technology. We propose that this can be achieved by bringing back the discussion of non-organisational actors – societal groups as divided in a class system (from Marxist tradition). This is because different societal groups can affect and are affected differently by the organisation's choice of certain technology, hence they should be included in the discussions of organisation and technology. Moreover, at this stage, the concept of stratification, as developed in the accounts of CR philosophy, will help in explaining how various levels of social class are affected differently by the technological changes, as adopted by the organisations. This work also utilises the concept of emergence to clarify that, although technology is a product of human action, once designed and implemented it cannot be reduced to the actions of its users. Technology possesses material properties and affordances that can either facilitate or restrict its use when applied in different socio-economic contexts.

Chapter 3: Methodology

3.1 Introduction

Although the foundations of critical realism can be traced back to the 1970's and associated with the work of Roy Bhaskar (1998), information systems scholars' adoption of this philosophy to define their research is fairly recent (see MISQ special issue of critical realism 2013, for example). According to Bygstad et al. (2016: p. 83), 'the [information system] researchers now require clearer methodological guidance on how to employ this perspective in their empirical work'. It is this task that the researcher aims to undertake in this chapter, and to serve this purpose, the chapter is divided into two sections. The first section explains the ontological assumptions and ontological positioning of this research study, arguing that CR provides a useful underpinning for understanding the entwining of the social and the material. In the second section of this chapter, following the CR methodology, this research project uses the concept of mechanisms and extends it by associating the concept of affordances (as presented in the work of Bygstad et al., 2016) as a useful extension to Bhaskar's retroductive analysis. This CR informed data analysis is used to help identify various causal mechanisms and affordances that arise from the interaction of organisation, technology and society. This is followed by a discussion of qualitative methods applied to this research. The creation of the case-study using both textual data analysis and theory driven semi-structured interviews will be discussed. The details of an unplanned, non-participant observation, and how it helped in developing a well-informed case study, will also be shared here.

In order to carry out the research agenda, the questions posed by this thesis are as follows:

Research Question 1:

- Why is it important to study the wider societal context surrounding organisation and technology?
 - How does society relate to the organisational use of technology?
 - How do the interplay of technology and organisational actors impact societal structures such as the social class system?

Research Question 2:

- How and why do similar technologies provide capabilities/options for the differential treatment of social class?
 - How and why do the material properties of technologies offer affordances in some contexts and not others?
 - What mechanisms can explain the differential experiences of separate societal groups arising from interaction with similar technologies?

Research Question 3:

- How does the concept of social structure and the class system relate to socio-material theorising in organisation studies?
 - What utility does the concept of affordances provide in CR informed socio-material approaches?

3.2 Explaining Ontology

This section deals with defining the ontological positioning of this thesis. As this research mainly borrows concepts from the Critical Realism (CR) tradition for the purpose of conceptual clarity, the attributes of CR, especially associated with the work of Bhaskar (1975) and their practical applications, are explored.

Contrary to the approach of positivists and constructivists focusing on epistemology, i.e. how to study a social phenomenon, for researchers belonging to the CR tradition, the issues relating to ontology, i.e. what a social phenomenon actually is, are more important (Ackroyd & Karlsson, 2014). It is argued that the ontological focus is important for two reasons: firstly, it helps the researcher in making knowledgeable assumptions about the reality of the world and, secondly, this ontological standpoint is then reflected in the researcher's selection of the research design and methods adopted in order to know the reality of the world (O' Mahoney & Vincent, 2014). It is for this reason that a CR guided researcher is mostly concerned about the appropriate form of methods or techniques being used to interpret the research topic. Most importantly, the motive of a researcher following the CR approach is to uncover the social processes or mechanisms at play that can potentially explain the otherwise confusing results/outcomes (Ackroyd & Karlsson, 2014).

Within the field that examines the relationship between technology, organisation and society, researchers have displayed different ontological commitments as they try to explore the reality of the social and material aspects. Their selection of the ontological view point can be seen in the way they have presented/outlined in their writings the relationship between the agency, context and action. For instance, as discussed in the literature review chapter in detail, Latour's 'Actor Network Theory' (1987) proposes the equal treatment of human and non-human actors, while emphasising the importance of the networks in which they are embedded. The ANT thus suggests that debates around human agency and technology are of secondary value, and what is more important is the recognition of the fact that properties of both human agents and technology are created by the network of which they are a part. Thereby the ANT implies that human agents and technology are symmetrical in that they only come into being when connected to other things through an agency. Alternatively, there are approaches such as that of Orlikowski and Walsham (1995) which propose technological dualism. Orlikowski's work conflates structure and agency and argues that both are intertwined concepts that cannot be studied separately. Orlikowski proposes and presents this entanglement of structure and agency as a response to avoid charges of work being labelled either technological determinism or human determinism. Another approach that resonates well with the CR tradition is socio-material approach based on Mutch's work (2002, 2005, 2010 & 2013) to study the social and material aspects of reality. This approach proposes the separation of the social and the material solely for the purpose of better analysis. The use of CR concepts provides great utility in the development of this approach through its ontological framing that suggests there is a rudimentary difference between 'parts' and 'people' (Willmott, 2000), therefore they should be studied separately. Furthermore, socio-material approach applies the concept of stratification to argue that both the social and the material have different levels –'real, actual and empirical'– and these should be analysed to generate real/useful insights. Socio-material approach also utilises the concept of emergence to argue that both the social and the material have emergent properties irreducible to the system from which they have emerged, and are capable of working in their own rights. It is for this reason that this research utilises concepts from the socio-material theory, because it is interested in uncovering the mechanisms operating at various levels of an organisation, social class and technology.

3.2.1 Subjectivism and Objectivism Debate

When we speak of studies undertaken by organisational researchers, there are two basic perspectives on offer: either the world is considered to be a closed system, completely under human control and unproblematically known via experiments and observations – positivism/objectivism; or the notion that the world is not known at all and that whatever we know about the world is through the language or the product of discourses interchanged by humans –Subjectivism (Ackroyd & Fleetwood, 2000: p. 3-4).

Both objectivism and subjectivism are charged with ignoring the ontology [of being] and over emphasising the epistemology [the human understanding of being] (Mutch, 2013: p. 02). For a subjectivist, anything that is not known does not exist, whereas objectivists are in a rush to dismiss any claims about the world that do not deal with facts. The theories developed by objectivists tend to rely on ‘statements about event regularities’ and how these regularities are correlated (O’ Mahoney & Vincent, 2014: p. 03). As a result, the positivists tend to collect large quantitative data set by obtaining answers to questionnaires and propose statistical correlation between different variables. This ‘reification of correlation’ that is developed in a close system provides a thin account of social reality. O’ Mahoney and Vincent illustrate this point by asserting that:

‘Positivists might assert that performance related pay (PRP) is correlated to better overall organisation performance, but they would often be less interested in or fail to recognise the existence of mechanisms which may, or may not, explain how these two phenomena relate... Critical realists would argue that there may be a number of ‘knowable’ reasons why PRP might be correlated with higher performing companies which have little to do with performance being caused by such schemes. These might include wealthier companies being able to afford such schemes or that PRP and higher performance are both triggered by a third factor (such as proactive managing directors), whilst they actually have no direct relationship at all’ (2014: p. 04).

The subjectivists presuppose that social reality is constructed entirely by the human determined conception-concept. As defined by Ackroyd and Fleetwood (2000: p. 08) ‘there is no extra discursive realm that is not expressed in discourse; the social world is generated in discourse’. Subjectivism thus rejects the possibility of an objective social world that is unknown

to social scientists. This refusal to admit the ‘possibility of knowing’ any non-discursive reality means that subjectivists have to take narratives and stories at their face value. Furthermore, the subjectivists also reject the claim of a ‘better understanding of the social world’, because of the notion that ‘all theories are equal’. In other words, this implies that for subjectivists, a layman’s account of reality (neither critically evaluated nor tested) is equal to that of a social researcher/scientist (O’ Mahoney & Vincent, 2014: p. 5-6).

3.2.2 Critical Realism: An Overview

There are philosophical traditions that support non-objectivist and non-subjectivist writings in the studies of organisations. Organisational literature is replete with studies that use the realist tradition to underpin the research on a said topic (Ackroyd & Fleetwood, 2004). Contrary to the objectivists and subjectivists, realists strongly believe in ontology suggesting that even if there remained no individuals or societies, the world would still exist. The realist philosophy draws on a rich and long established stream of social sciences taken into consideration because of the conviction that social structures (mechanisms, relations, power, rules, resources, institutions and so on), the meanings that actors and groups attribute to their situation, and the discourse used to convey these meanings must be taken into account in any explanation of events’ (Ackroyd & Fleetwood, 2000: p. 05). Unlike objectivism, where natural phenomena are empirically observed/analysed and measured, and unlike subjectivism in which subjects are studied in socially constructed settings, critical realism focuses on reality and its underlying causes, it is about objects [physical, social or conceptual], entities and structures that exist - unobservable yet possessing the ability to act in certain ways and generate events. (Mutch, 2013: p. 02). What is important in the critical realism philosophy is the interaction/relationship of objects, entities and structures that lead to events known to humans.

CR was founded by Roy Bhaskar (1975, 1993 & 1998) and arose as a result of the criticism of positivism (Fleetwood & Ackroyd, 2004) and constructivism (Bhaskar, 1978 & 1979). Bhaskar’s work has garnered a lot of interest across social sciences (e.g. Sayer 2000; Lawson, 2003; Archer, 2000 etc.). Bhaskar (1998: p. 21) proposes that there is an essential reality which acts independently of human perception/knowledge: ‘there is an intransitive world that is real, and a transitive take on that world through the perception and theories that we develop about it’ (Houston, 2010: p. 75). The transitive domain concerns the efforts of humans to construct meanings, to understand what is out there, through their fallible discourses. It is ar-

gued that as our attempts to explore reality become more sophisticated, our claims about the reality of the world come closer to being accurate, but will always remain far from what the intransitive world actually is. Nonetheless, a more refined conceptual and theoretical framework offers a solid base for an analysis that is closer to the reality of the world.

3.2.3 Stratification and Emergence

The CR philosophy's distinct offering resides in its two integral principles/concepts: the stratification of reality (ontology) and the emergence. The former suggests that reality is divided into three distinct layers, i.e. real, actual and empirical dimensions (Bhaskar, 1986), and it is important to distinguish the domains of empirical, actual and real if researchers are to have a better understanding of any social phenomena. The first form of stratification is between mechanisms, the outcomes that they produce, that lead to events that they generate, and the subset of events that are actually experienced. The real contains 'whatever exists': mechanisms, events, and experiences (i.e. the whole of reality) (Sayer, 2000: p. 11); the domain of actual consists of events that do (or perhaps do not) occur, and includes the empirical knowledge that arises out of fallible experimentation and experience (Mutch, 2013: p. 02). According to O' Mahoney and Vincent (2014), the notion of stratified ontology eliminates the simple dichotomy between objectivists and subjectivists.

Another distinct feature of the CR philosophy is its identification of the concept of emergence. According to this concept, the process by which entities (parts) interact with each other leads to the occurrence of events with causal powers greater than that of its lower parts (Elder-Vass, 2010). For CR researchers this process of interaction is important in order to understand the causal relationships that describe how different entities relate to each other and are organised hierarchically at different levels to transform the entity. Since this research focuses on the 'change within K-Electric' in the post-privatisation period, it is important within the given research setting to understand various causal powers because change happens when 'the causal powers of one entity interact with those of another' (O' Mahoney & Vincent, 2014, p. 08). Within the current research setting, this means looking for mechanisms (both direct and indirect) that cause transformation, such as Abraaj Capital taking over K-Electric's operations, implementing the SAP technology, and so on.

In doing so, it is equally important to understand that these entities make a difference in their own right, hence it is unjustifiable to consider them as mere parts of a greater whole. Therefore, for a better analysis it is necessary to decompose the sum of the entities, or the whole, into parts (entities) and understand the distinct features of the smaller entities. On the other hand, the concept of emergence outlines that entities, though dependent on certain activities, cannot be determined by the activities of their parts. An entity has distinct characteristics of its own. That is to say that although different parts join together to form a greater whole, the features/properties of that greater sum cannot be reduced to the individual properties of its parts. O' Mahoney & Vincent (2014) clearly explain this by giving the example of teams where many individuals bring their distinct qualities and form a team, but the results achieved by the team cannot be reduced to individual activities of the team members (p. 07). Such explanation is very useful when applied to the analysis of the social world and technologies as implemented in organisations. It helps in understanding the social phenomena and emergent properties of entities including technological systems, to allow a better understanding of the nature of the entities.

3.2.4 Mechanisms and Affordances as Analytical Tools

Scholars stress that the most important part of a critical realism informed data analysis is the identification of causal mechanisms within the empirical studies. Since, unlike the natural and social sciences, studies of IT-enabled organisational change focus on the socio-technical mechanism, here, the concept of affordances from the field of psychology provides great utility. It is argued that, despite displaying striking similarities, few researchers have attempted to link the concept of affordances with CR (see, for example, Volkoff & Strong, 2013; Bygstad et al., 2016) to inform IT-enabled organisational change. Although Leonardi's work (2011) makes a significant contribution in utilising the concept of affordances for the underpinning of social and material, he does not follow the CR tradition. Both mechanisms and affordances exist at the level of real, irrespective of whether or not they are triggered/actualised, and are considered to be potential of an action rather than an action itself. Mechanisms, however, are a broad concept, i.e. not human dependent, whereas affordances are dependent on human action in order to be triggered. Generative mechanisms are thus 'the causal powers and liabilities of objects or relations' (Sayer, 2010; p.104), having potential to both enable and restrict action. Mechanisms thus have causal powers and are not deterministic. Finally, mechanisms may arise from a structure, from the relation between structures, or from the relation between structures and actors (Volkoff & Strong, 2013; p. 821). When these

structures interact with each other, new structures emerge, therefore the focus should also be on exploring the relationship between the structures. The strength of a CR philosophy is that it acknowledges the structures to be enduring (at least to some extent), and, although not deterministic, capable of encouraging or restricting an action. From a critical realist viewpoint, understanding organisational change associated with IT implementation requires apprehension of mechanisms related to the structures of IT (Mutch, 2010). On the other hand, CR tradition also acknowledges the agency or ‘free will’ of actors to make conscious decisions to achieve their desired outcomes by creating, modifying or reproducing the structures (Carter and New, 2004: p. 820).

Affordance, on the other hand, is a part of the whole set of generative mechanisms. Hence, affordances are not characteristics of actors or objects, but arise from the interaction of actors (with their desired actions) and objects (with their material properties) (Leonardi, 2011). Within IS literature, affordances refer to the tendencies made available to actors by the IT objects with which they interact, thus differentiating them from the generative mechanisms that ‘may arise from structures alone, and their causal powers triggered without the intervention of an actor’ (Volkoff and Strong, 2013: p. 823). It is therefore suggested that if a researcher intends to study information systems and their impact on the organisation and society as whole, the concept of affordance with its more focused approach can provide better utility.

The CR perspective rejects the idea that mechanisms and affordances when applied/activated will consistently bring the same results, and favours the concept that the results of a mechanism/affordance may vary when triggered under different contexts. This implies that ‘we cannot use mechanisms to predict a phenomenon, but to explain it’ (Bygstad et al., 2016: p. 85). Firstly, this explanation makes it easy for researchers to then explain why similar technologies produce different outcomes, even within the same organisational context (different outcomes experienced in different departments), or even when the scope of study is widened to cover the societal context. Secondly, in order to understand what causes similar technologies to produce different outcomes, iterative processes can be applied until the researcher reaches a satisfactory conclusion.

3.3 Research Design

In this section, the research design of this thesis is explored in detail. This section starts with the discussion of an exploratory phase of the research design during which the author investigated the transfer of business models (technologies) from developed countries (Western and North American block) to developing countries. The emerging empirical themes were then used to develop a retroductive approach that was considered to be appropriate for this research topic. Thus, the retroductive approach shapes the creation of the case-study and methods (semi-structured interviews, textual data and non-participant observation) as applied in this work. The research design adopted for this piece of work is outlined in table 3.1.

In what follows, the exploratory phase of this research is defined in detail and will then set up the background for the discussion of how this thesis has adopted Bygstad et al.'s (2016) stages of CR informed data analysis.

3.3.1 Exploratory Phase of the Research Project

In the creation of this case study, textual data, semi-structured interviews and some non-participant observations have been major sources of information. At the initial stage, the research project was exploratory in nature. In the first year of the study, the researcher loosely focused on a broad area – namely, the transfer and implementation of Western technological business models (enterprise systems) in the developing/non-western economy of Pakistan. However, the initial focus of research was on exploring existing relationships between knowledge workers (consultants) and the IMF and World Bank which facilitate international transfer of technological systems. To investigate the research agenda at hand, the researcher conducted 10 interviews with some international development consultants, all of them having experience of ongoing or completed development projects in different emerging Asian economies including Pakistan, which incorporated Western business models, (mainly technologies) considered benchmarks of efficiency. The selection of the international development consultants as respondents to the researcher's inquiry was solely due to these consultants' working as intermediaries for and on behalf of the IMF and World Bank. It was noted that due to increasing criticism of the activity of the IMF and World Bank, these macro-economic players were using knowledgeable intermediaries such as international development consultants to promote their preferred practices/policies in emerging Asian economies. Although this research area offered a lot of potential and the research focus was becoming

clear, later on, access to relevant information, necessary in order to develop rich knowledge of deep level mechanisms, was becoming a problem. Almost 100 e-mails were sent to some recently privatised Pakistani companies, where consultants funded by the IMF, World Bank, USAID, etc., were helping in the implementation of Western business models. The response rate was disappointing, with only 2 respondents willing to share information. However, the review of both the related literature and exploratory interviews generated useful insights at the macro-level regarding the role of the IMF and World Bank in development work in emerging economies.

As a result, despite this being a promising research area, the researcher has had to modify the research focus. Although the research continued on the same course, it was narrowed down by listing only those Pakistani companies that were privatised in response to suggestions made by the IMF and World Bank and had undergone technological transformation. The consultancy element of the research focus was excluded. As a result, K-Electric was considered to be a potential research site not only because it was privatised due to the treaty signed by the government with the IMF and World Bank and rolled out the SAP enterprise system soon after, but also because of the ease of availability of information about the company. Being the monopoly supplier of electricity to the biggest city in Pakistan, K-Electric was famous and well documented. The privatisation of K-Electric was a highly contested topic and a considerable amount of data on the said subject was already published and available on the internet. K-Electric's privatisation was so popular that even Harvard business school prepared a case study of the company, the content of which still remains debatable in terms of it being a true representation of events. The researcher once again wrote to officials of the company and this time the response rate improved as 12 upper level managers were willing to be interviewed. They also assured the researcher of efforts to make available some more potential respondents that would help in data-collection. Thus was made the decision of finalising K-Electric as the research site.

Table 3.1 Stages Of Research Design As Adopted By This Research

PHASES OF RESEARCH DESIGN	
1.Exploratory Phase	<ul style="list-style-type: none"> • Review of literature
	<ul style="list-style-type: none"> • Identification of important themes
	<ul style="list-style-type: none"> • Exploratory interviews
2.CR informed Data Analysis	<ul style="list-style-type: none"> • Main themes from the data used as the basis for further research.
	<ul style="list-style-type: none"> • Mechanisms and affordances used to extract and outline the initial relationship between the SAP technology and both organisational (employees) and non-organisational (customers) actors.
3.Selection of Qualitative methods	<ul style="list-style-type: none"> • Semi-structured interviews.
	<ul style="list-style-type: none"> • Documentary (textual) data analysis.
	<ul style="list-style-type: none"> • Non-participant observation.
4.Selection of case study design	<ul style="list-style-type: none"> • Retroductive case study.

Source: By the Author

3.3.2 The CR Informed Data Analysis

Although the CR philosophy is distinct because of its strong ontological stance, it is more lenient with methodology altogether and encourages different methodological stances (Bygstad et al., 2016). From a critical realists' viewpoint, knowledge about the world/reality can be gained in multiple contending ways: hence the selection of one or more methods deemed more appropriate than others would depend on the nature of the researcher's inquiry (what is being sought). CR researchers are therefore proponents of the mixed-methods research strategy (i.e., variety of methods used in the same research project), because it helps the researcher in verifying the subjective and objective reality of the world (Mutch, 2013: p. 01).

That said, most researchers that adhere to the CR tradition base their analysis on the retroduction approach because it helps to trace back the mechanisms and affordances responsible for shaping an empirical event (see Wynn & William, 2012 for the latest commentary on this). Houston (2010: p. 82) asserts ‘retroduction, which is adopted by critical realism, refers to the inference from the description of some phenomenon to the description of something that produces it or is a condition for it’. In Bhaskar’s (1978) words, merely knowing that an event has occurred due to another event, is confusing. However, uncovering the mechanisms, active within one event, that produce other occurrences/events, is what matters. The retroduction method takes a step back from the effect visible at an empirical level and traces the mechanisms that have logically caused that observable event (Peirce, 1958).

Researchers within IS field argue that the CR researcher’s over reliance on retroduction is partly due to the lack of an alternative approach that provides clear guidance for uncovering mechanisms. Alternatively, Bygstad et al. (2016) suggest that in the case of IT enabled organisational change, the researcher can actually utilise affordances and mechanisms as analytical tools to retroduce events. In-depth interviews can be designed to focus on technology and inquire about tasks the technology enabled the actors to accomplish? What tasks did the introduction of technology make harder to achieve?? Why was the technology implemented? What outcomes were observed once the technology was put to use? Using this approach can help the researcher to trace back affordance and underlying mechanisms from the empirical events.

As this research aims to explore the impact of the SAP technology on wider social structures (organisation and society), it is important to go backwards and uncover various deep level structures/mechanisms (within the domain of the real) that might have been at play. In order to accomplish this, the researcher needs to ask both organisational and non-organisational actors about their perception of SAP technology and their direct and indirect encounters with it. The step wise data analysis as performed in this work is outlined in Table 3.2 and explained in detail below.

Table 3.2 Steps of Critical Realist Data Analysis

Step One	Description of events and issues.
Step Two	Identification of key entities.
Step Three	Theoretical redescription
Step Four	Retroduction: Identification of candidate affordances via: A) Identification of immediate concrete outcomes. B) Analysis of the interplay of human and technical entities. C) Identification of candidate affordances. D) Identification of stimulating and releasing conditions.
Step Five	Analysis of the set of affordances and associated mechanisms.
Step Six	Assessment of explanatory power

Source: Adopted from Bygstad et al (2016: p. 89)

3.4 Steps of CR Data Analysis Applied in This Research

Once the research site was finalised, it was followed by an exploration of the existing online textual data about the company. Firstly, this textual data was scrutinised in chronological order. All documents and newspaper articles relating to the case study, from the period of the privatisation of the company in 2005, to the takeover by the current management in 2008, and the most recent events within K-Electric, were examined to establish a timely record of events. In addition to the main events observed through the already available text, the collected data set was used to highlight other important events that were pointed out by the research informants (interviewees). As a result, multiple events were observed at the empirical level. However, not all of these were considered pertinent to the researcher's inquiry. The level of detail in data collected for each event thus depended on how interesting and relevant the issues were perceived to be. Applying the retroduction method, these details were used to trace back the mechanisms responsible for shaping the events. The timeline of important events is presented in Table 3.3.

Table 3.3 Timeline Representing Main Events After K-Electric’s Privatisation.

Year	Main Events
2005	Privatized to Saudi Consortium.
2008	Shares sold to Abraaj Capital.
2008	Worker union’s resistant movement against unemployment.
2009	Concept of IBCs pilot tested.
2009	Launched marketing campaign to reposition company’s image.
2009	SAP system introduced.
2009-12	Extensive training sessions arranged for employees to learn functionalities of SAP system technology.
2009-12	1010 MW electricity generation capacity claimed to be added.
2010	Deliberate use of SAP technology to create wide billing brackets to charge majority of customers maximum tax and tariff charges
2011	K—Electric accused of unethical meter reading practices
2011-12	Over reliance on government subsidies, despite posting the first profit
2012	28 IBC divisions opened.
2012	Cultural change management program introduced.
2012	Mobile and online billing services introduced.
2012	IFC and ADB acquired stake holder status.
2012	K-Electric accused of overbilling

2012	IFC monitoring teams started routine visits to IBCs
2012	K-Electric announced its first Profit
2013	IBC data shifted completely on SAP system.
2013	Illegal connection cut out operation started.
2013	K-Electric accused of adding unexplained charges in customer bills
2014	Smart-Grid system pilot tested.
2014	Inadequate maintenance resulted in the worst blackout, plunging 60% of the city in darkness
2014	K-Electric found guilty of stealing government's Gas
2015	K-Electric accused of deliberate power cuts during severe heat-wave

Source: Table compiled by the author

3.4.1 Description of Events and Issues

For example, Table 3.3 shows that although the workers' resistance towards downsizing the employees in the 2008 post-privatisation period was a major, well-documented event, it had no relevance to the researcher's topic. Hence, during the interviews that followed, the interviewees were asked no further questions were about this event. Similarly, since the company previously had a negative public image due to its faulty practices, a massive marketing campaign was initiated in 2009 to reposition the company. Although this event saw the company invest billions, it wasn't pursued further in the interviews given its irrelevance to this research.

Since a closer examination of events and further details obtained on them clarified which events were important and which ones only seemed to be important, the focus was shifted to events that were closely linked to the implementation of SAP technology (a detailed description of these important events is provided in the case study chapters). These important events included the strategic decision to open up IBCs supported completely by the SAP technology to centralise the business operations and achieve better control of activities. The IBCs (Inte-

grated Business Centres) were the offices of K-Electric, located throughout the city of Karachi. During the implementation of SAP technology, various important events took place, such as the introduction of various components of SAP, including the introduction of wider billing brackets, mobile payment application, billing components, CRM, maintenance, smart grid technology and customised software to control the electricity supply to different regions of the city. The profit earned by the utility in 2012 was also significant, as K-Electric's management and its successful use of SAP technology was highlighted at an international level. In 2012, more controversial news concerning K-Electric's unethical business conduct (misuse of SAP technology to maximise profits, constant failure to comply with regulatory authority orders, and increasing customer discontent) began to surface, providing hints about the two contradictory accounts of reality-making, in-turn revealing that a more detailed explanation of these events is required to provide a comprehensive analysis. As a result, during the second data collection trip, interviews with the organisation focused on organisational performance during the post SAP implementation period, and outside the organisation focused on problems different groups of society encountered due to the practices of K-Electric during the post privatisation period.

3.4.2 Identification of Key Entities

Once the main events were identified, the researcher began to link different entities (actors and objects) to the events. This mapping lead the researcher to assume that not only were organisational actors (employees) and technology associated, non-organisational actors (customers) were also an important part of this interaction of entities. As the core object in this case was SAP technology, its components were mapped and their association/relationship with both organisational and non-organisational actors was delineated. We discuss the complete structural design of SAP and its functionalities in detail in Chapter 5. Table 3.4 below presents the association between actors and IT objects.

Table 3.4 Association between SAP’s Components and Actors

Association with organizational actors	Components of SAP	Association with non-organizational actors
Control room staff	Customised control of electricity supply.	-----
Line staff	Meter reading	-----
Data entry staff	Billing component	Customers
Technicians & engineers	Maintenance	Customers
Online – updated automatically over the counter – data entry staff	Payments	Customers (e-billing, mobile payment methods etc)
Customer services/help desk staff	CRM	Customers
K-Electric’s top management	Smart grid component	-----

Source: Prepared by the author

The mapping of SAP components along with identifying associated actor groups helped this research to identify that organisational technologies that have a direct impact on non-organisational actors. However, some of the components of SAP were designed to facilitate the organisational actors, including meter reading, and smart grid technology (to help locate and prevent electricity theft and line losses). Other components of SAP, such as maintenance and customised electricity supply control, have a dual impact. On one hand, the maintenance component alerted staff when upgrade work was required. On the other, if poor maintenance resulted in interruption of electricity supply, this contributed to customer dissatisfaction with the utility. A custom built feature of SAP technology that enabled control room staff to shut down the power supply of specific (mainly poverty stricken) regions at the management’s discretion also led to public criticism of the utility. Similarly, despite the billing component being designed solely for internal employees (for issuing bills), the way this component was

used to charge customers had a direct impact on customers. For instance, as we shall see in Chapter 5, the company was using wide billing brackets such as 300-700 units to charge customers. These brackets allowed the company to charge the (highest) same tariff and VAT to consumers spending 300 units as those consuming 700. Additionally, the billing component was adding extra unconsumed units to customer bills and charging customers for various facility charges against the orders of the regulatory authority. Contrary to this, certain components provided utility for both customers and employees. Employees could update customer payments, and customers could also use mobile payment methods to pay their bills. Other components of SAP, such as CRM (Customer Relationship Management) technology, provided an interface for customers to interact directly with organisational actors in case of complaints, requests or queries.

3.4.3 Theoretical Redescription (Abduction)

As described previously in the exploratory phase, exploring how the IMF and World Bank were related (if at all) with the institutionalisation of new business innovations (such as the opening of IBCs and implementation of SAP technology) within K-Electric, was of great interest to the researcher. This line of enquiry would make a very interesting topic of research with which to explore the role of these macro-economic actors (embedded in the wider economic context) in shaping K-Electric's organisational activity in the post privatisation period. As a result, most of the interview questions attempted to explore this event extensively in the first data collection trip. The results, however, showed that the involvement of IMF and World Bank was only visible at a high level (state level policy making), where it successfully convinced the government to privatise K-Electric. Later, it was observed that the IMF and World Bank made no contribution to the post privatisation business operations of K-Electric. This means that this event had no direct relevance to K-Electric and its implementation of SAP technology, however, exploring the role of the IMF and World Bank proved to be useful in understanding the backdrop of K-Electric's privatisation (more details of this event are provided in Chapter 4). As the researcher developed an awareness of the absence of macro-economic players in the post privatisation K-Electric, the role of IFC and ADB (that acquired stakeholder status in 2012) was therefore only touched upon and treated only as an important event and strategic move by the company, as the IFC and ADB supplied financial resources that K-Electric utilised to support its technology implementation initiative.

As a result, the researcher re-conceptualised the research questions to focus entirely on the interplay of organisation (K-Electric), technology (SAP system) and society (customers). The new task at hand was therefore to locate both affordances and mechanisms that contributed to polarised views concerning the post SAP performance of the company.

3.4.4 Retroduction: Identification of Candidate Affordances

After step 3, a new research question emerged to further the research agenda at hand: what mechanisms can explain the polarisation of views (success for some, and massive organisational misconduct for others) on the post SAP performance of the company? Since K-Electric's study depended on IT objects, addressing this question involved identifying the outcomes and retroducting affordances from them. However, since IT alone could not explain the differential views, it was also necessary to retroduce mechanisms from the context.

Sub-step 1: The Identification of Immediate Concrete Outcomes

Tangible outcomes are a product of a goal directed actor. Within an organisational context, this can be collective action taken by organisational actors (i.e., management). In a societal context, this can be the action of non-organisational actors (i.e., a group of consumers). Thus we considered both organisational and non-organisational actors, their encounters (direct or indirect) with technology and with each other to determine what outcomes this interaction produced. We discovered that, for organisational actors, the intended outcomes were reducing electricity theft and line losses, and maximising profit. For non-organisational actors, the outcomes included unexpectedly large bills, regular interruptions to power supply and below average customer services that translated into customer dissatisfaction.

Sub-step 2: The Interplay of Human and Technical Entities

At this stage we attempted to identify entities associated with each observed outcome. For example, both organisational outcomes of profit maximisation and reducing electricity theft relied on SAP technology, its various components (billing, maintenance, customised electricity control and smart grid technology), and the specific ways in which these components were used. For non-organisational actors, ensuring a quick customer response would depend not only on a functional CRM software application and an electronic complaint launch system, but also on the way the call centre/helpdesk staff handled complaints and queries and the

presence of a powerful regulator. Similarly, an uninterrupted power supply would depend on technical objects (power plants), their maintenance and upgrade, prompt repair of faults, quick restoration of power supply, expert technical staff and, once again, a powerful regulator.

Sub-step 3: The Identification of Candidate Affordances

For the ‘billing’ affordance, we first identified the outcome of ‘over billing’ and then traced the associated entities (management and employees). Finally, we outlined the enabling conditions such as the ‘opportunity of easy access to the billing component and authority to create billing brackets and input units in customer bills’.

For the ‘electricity theft’ affordance, we identified the outcome of ‘company losses owing to illegal power connections’. The associated entities here are the objects and customers. Enabling conditions were easy customer access to local transformers and main power supply lines, where wires can be easily connected to illegal obtain electricity.

Similarly, for the ‘maintenance’ affordance, the unannounced electricity supply interruptions and line losses were identified as concrete outcomes. Associated entities included objects (power plants) and maintenance staff. The enabling conditions were then identified as once again being access to the maintenance component, management decisions to ignore system warnings for plant maintenance, neglect to upgrade power supply lines and lack of trained professionals (technicians and engineers) and skills resulting in prolongation of the time taken to restore electricity supply.

In the case of ‘customised electricity supply control’ affordance, the direct outcome was power being cut off, mainly in low income neighbourhoods. The associated entities were objects (custom built SAP function to control power supply of different regions individually) and the control room staff that performed the task. The enabling conditions were access to the electricity control function and lack of leverage on the part of the low income neighbourhoods. The process of retroducting candidate affordances from the observed events is outlined in Table 3.5

Table 3.5 Retrodution Process of Candidate Affordances

Observed outcomes	Affordances	Associated entities	Enabling conditions
Overbilling	Billing affordance	Actors (management & employees) and objects (billing component)	Access to the billing component
Company losses due to illegal power connections	Electricity theft affordance	Electricity transmitting objects and actors (customers)	Access to nearby transformers and electricity supply lines
Interruptions in electricity supply, line losses	Maintenance affordance	Objects (power plants,) and actors (technicians and engineers)	Access to maintenance component, management’s neglect of timely maintenance
Power cut off in middle and low income neighbourhoods	Customised electricity supply control function	Objects (customised control function) and actors (control room staff)	Access to the customised control function

Source: Prepared by the author

Sub-step 4: Identification of Stimulating and Releasing Conditions

Whether or not an affordance is exercised depends upon the contextual conditions. For example, in the case of ‘electricity theft’ affordance, the stimulating condition was K-Electric’s meetings with its board of directors and outside IT consulting firms to formulate a strategy to prevent line losses caused by the practice of electricity theft and low maintenance. The releasing condition was an innovative solution to use smart grid technology that precisely locates the source of the power theft and determines where line losses are caused by poor maintenance.

The stimulating condition behind the actualisation of billing, maintenance and electricity supply control affordance was found to be management’s desire/decision to cut their losses and generate revenue. The releasing condition then was the customer’s lack of knowledge to interpret their electricity bill, a lack of power to block K-Electric’s unethical conduct, and the weak position of the regulatory authority. It was observed that K-Electric was able to actualise these affordances only because the majority of customers were not educated enough to

understand the bill and how it was calculated, and also because NEPRA was unable to enforce its rulings on K-Electric. The researcher continued to reproduce the affordances in a similar pattern.

3.4.5: Analysis of the Set of Affordances and Associated Mechanisms

The affordances identified in this research can only be thought of as initial building blocks used to develop a systematic analysis; further analysis was contingent upon the identification of mechanisms. Since the affordances are an outcome of the interrelationship of technology and goal directed actors, they cannot fully explain the impact of technology on societal structure, the class system and non-organisational actors. Identifying mechanisms thus allowed the researcher to analyse the enabling/constraining, stimulating or releasing conditions that surrounded the focal point of the research – the organisation and technology (Bygstad et al., 2016; p.92). Since an important aspect of this research is to explore how organisational technology relates to society, the researcher furthered the analysis by grouping the related affordances and associating them with underlying mechanisms, as shown in Table 3.6.

Table 3.6 Affordances and The Underlying Mechanisms

Affordances	Mechanisms (contextual conditions)
Group affordances	
Concept development of SAP System	Strategic/Innovation mechanism
Pilot testing of SAP System	
Introduction of SAP System	
Group affordances	
E billing and mobile payment app	Service mechanism
Customer call centres (CRM)	
e-complaint handling and monitoring (CRM)	
Group affordances	
Smart grid technology	Control mechanism
Overbilling affordance	
Custom built – region based, electricity supply control	
Maintenance function	

Source: Prepared by the author

As seen in Figure 3.6, we grouped the concept development, pilot testing and implementation of SAP technology into a generalised strategic innovation mechanism. We continued to repeat the process of grouping affordances and identifying the underlying mechanisms this way. Similarly, mobile payment applications, CRM and e-complaints were identified as parts of the services mechanism initiated by K-Electric to improve the customer experience. Lastly, we linked smart grid technology, overbilling, customised use of the SAP system to control the electricity supply of different regions individually, and the maintenance function as a means to action organisational or managerial control and produce the desired outcomes.

3.4.6: Assessment of Explanatory Power

From a CR perspective, we know that many mechanisms exist at the level of real, yet an empirical study will only be able to identify a small number of them. That said, not all the identified mechanisms will explain the phenomenon under study to a satisfactory level. The role of the researcher then is to select those mechanisms that offer a better explanation of an event (Sayer, 1992 & 2000). This process of ensuring that the chosen mechanisms enable the researcher to make better informed claims about reality, is known as ‘empirical corroboration’ (Wynn & Williams, 2012).

In K-Electric’s case, the researcher evaluated a set of possible mechanisms against the empirical findings. Firstly, the researcher investigated whether the implementation of SAP technology could be associated with the economic mechanism, to account for the IMF and World Bank’s involvement in pushing for the adoption of westernised models in Pakistan’s business context. Certainly, this aspect of analysis could not be dismissed entirely given the IMF and World Bank’s role in the privatisation of K-Electric. However, the researcher observed that the empirical findings were inconsistent with such hypothesis. It was also observed that the SAP was implemented as a result of a strategic decision to put in place innovative technological reforms that will ensure tighter management control over various business operations.

Alternatively, it might seem logical to assume that the ‘knowledge mechanism’ could explain the involvement of the international academic community in pushing for the institutionalisation of western business-technological models, given their visible support for the new management. Once again, this claim was not well supported by the empirical findings. It was

concluded that, despite the identification of several active mechanisms, the mechanism outlined in the analysis was consistent with all the data.

3.5 Seeking Evidence: Qualitative Method

In this section, we will describe the process of scrutinising the evidence to illustrate the relationship between the organisation, technology and society. A qualitative research methodology is adopted to uncover the debate around the organisational use of the SAP technology and the formation of the meanings and reactions attached to it. A case study was constructed which covered the period in which the post-privatisation changes took place within K-Electric, especially those relating to the implementation of the SAP technological system between 2005 and 2015. The data was collected in two intervals; firstly, in the year 2013, and recollected in the year 2015, to observe changes and to better understand the effects of the causal mechanisms over time. The contested and controversial nature of both the privatisation of K-Electric and the use of the SAP technology meant there was an abundance of topic-data already published and available. Though some secondary sources were also used, 'semi-structured interviews' remained the main method for collecting evidence. These data collection techniques informed the way the case study was constructed.

3.5.1 Qualitative Research Methodology and CR Perspective

According to Bryman (1988 & 2008) it is the epistemological difference that separates quantitative research from qualitative research. Kelemen and Rumens (2008) also share a similar viewpoint that research methods cannot be exclusively generalised as qualitative or quantitative. Taking these constructed differences into account, this study chooses qualitative research and the methods that are predominantly used with it. It is also noted that the CR ontology fits in well with the qualitative research methodology, which supports the belief that the social and natural worlds are mediated by the subjective experiences of people. The complex interplay of structure and agency has already been outlined and discussed in the previous chapter, yet we reiterate that the only possible way to uncover real structures and gain knowledge of their generative mechanisms is by interpreting the events occurring within the domain of the actual that are subject to/associated with human perceptions and meanings. Put simply, as stated by Archer (1995), researchers have to explore the events within the empirical level of reality if they want to develop reasoning that connects with the actual and real levels of the world. Thus, in order to understand the socio-economic structures and their in-

terplay with human agency, the researcher needs to explore events empirically so that they can be perceived correctly and carefully given meaning. As stated by Ackroyd and Karlsson (2014):

‘[F]or CR-guided researchers, the role of a research method is essentially to connect the inner world of ideas to the outer world of observable events as seamlessly as possible. How this is to be accomplished, however, is not obvious and there are a few reliable rules about how to proceed.’ (p. 21-22).

It is argued that a CR researcher’s approach to choosing research methods is altogether more flexible and adaptive, unlike that of positivists or constructivists which strictly follows one standard method (Ackroyd & Karlsson, 2014). In order to connect the research ideas with events related to the social world, researchers should keep thinking about the information required to generate useful insights if further information is required to fully understand the outcomes of the social world’s events. Positivists mainly rely on distributing questionnaires, in large proportions, to their targeted audience and then statistically work on these data sets to generate ‘factual results’. On the other hand, constructivists prefer ethnography to observe the subjects of their research in order to interpret the meanings these subjects attribute to their real life events. In contrast, a CR researcher may choose different research methods, i.e. in-depth interviews, questionnaires, observation, etc., or may combine all these methods, depending on the nature of the research questions. Furthermore, the researcher might choose to add different methods to explore new dimensions/aspects of the research topic at a different point or time. It is especially the case when the researcher feels that there is a need for further information, collected in a different manner, to answer the questions concerning the research topic. After collecting the information through the application of different methods, the researcher tries to add this information at a later stage. This ‘mixed-methods approach’ is utilised to develop a thorough understanding of the topic (Ackroyd & Karlsson, 2014).

Within my field, researchers, especially those belonging to the CR tradition, have adopted different methods or the mixed methods approach to carry on the research agenda (See Ashraf & Uddin’s 2013 work). These different research methods are then used to explore the interrelationship of an organisation, society and technology. Furthermore, in order to pull together a strong, evidence backed case study, researchers choose from wide ranging methods,

including textual data, interviews, questionnaires, participant observation etc. as their primary investigation tools. For example, Burawoy's (1979) work is based on participant observation to construct a strong case study. In what follows, the researcher examines a few cases that adopt textual data and interviewing methods to spell out the findings from their case studies, and how their choice of methods relate to the author's research focus.

Ashraf and Uddin (2013) adopt mixed methods including both textual data analysis and interviewing, but their findings are predominantly based on the data collected through interviews. Through the interviewing technique they probe into the effects and outcomes of the intervention of a foreign consultancy firm in a state owned entity, the Civil Aviation Authority, within an emerging economy – Pakistan. This research is in line with the 'research focus and context' of this study. In another instance, the work of Brown et al. (2012) is based on examining the textual data (written report) that sets the case for changing institutional practices deeply ingrained within an Australian old peoples' home. This research is also carried out on lines similar to those of the author's research agenda, but differs from the current research project because the technological change occurring within K-Electric only partly contributed to the textual data and was not solely determined by it.

In the summary, the CR researchers are not wedded to, or predetermined to use, specific research methods. It is suggested that this type of flexibility facilitates the researcher to choose a different method in case the chosen method does not work out, or if the researcher is not able to avail any method for any reason, or even when the researcher is not satisfied with the information generated by using one research method, as there is always a possibility that a different method might better obtain the required information (Ackroyd & Karlsson, 2014). The different research methods can also be combined as the researcher endeavours to expand the knowledge horizons on the specific topic to discover more causal mechanisms that might not have been identified using the previous research method. Hence it can be argued that successfully completing the research agenda at hand can be linked with the researcher's creativity rather than following strict rules for methodological choice (Ackroyd & Karlsson, 2014). In what follows, the researcher's selection of the research methods to carry out this research project will be outlined in detail.

3.6 Data Collection Method Applied in This Thesis

The qualitative methods employed in the creation of the case study/research design, as used in this research project, include semi-structured in-depth interviews, textual data analysis and non-participant observation, depending on the nature of the inquiry. As evident from the selection of data collection method, this research uses the ‘mixed methods approach’ for data collection as it enhances the richness of the researcher’s explanation of events by uncovering important mechanisms that shape the empirical accounts of reality. Nonetheless, the mixed methods approach also resonates well with the CR philosophy that emphasises the identification of generative mechanisms.

Firstly, the researcher gathered textual data such as the already existing company documents, the company’s internal magazine, and newspaper articles that were believed to be useful in answering the research questions. Informative data about the company was gathered also from the officials of NEPRA –the regulatory authority that oversees the operations of K-Electric. As already discussed, the craft of qualitative data is associated with overcoming the weaknesses of the selected methods; consequently, the drawback of using textual data was that it followed a certain perspective that did not necessarily reflect the researcher’s viewpoint or did not completely relate to the researcher’s inquiry. This issue was addressed, to some extent, by conducting semi-structured interviews where the researcher asked more specific questions that related to the research project’s focus.

Secondly, the in-depth interviews were conducted with participants from both within and outside the company, where customers (agents of society) were asked about their perception of and experiences with the utility in the post privatisation period. The employees, on the other hand, were specifically asked to share how the work processes and business operations changed after the implementation of SAP system technology. The semi-structured interviews especially helped, as in many cases the respondents, both within and outside the company, intentionally or unintentionally provided details of important causal mechanisms that shaped the outcomes in certain ways.

The researcher, therefore, decided to conduct in-depth interviews with as many concerned and knowledgeable people as possible, so that the mechanism operating at the ‘real level’ can

be uncovered and the real outcomes become known. Although this does not imply that the researcher is claiming to have explored the 'real level' social phenomenon of 'the impact of the SAP technology on K-Electric employees' in full. This is not possible given the fallible nature of human inquiry. However, the semi-structured interviews did help the researcher in uncovering the mechanisms that were considered to be generating the closest accounts of reality. A total of 60 semi structured interviews were conducted within and outside the company. Interviews within the company were conducted with managers, department heads (GM: General Manager of each IBC) and senior executives of the company (managers of IBCs). Interviews were also done with the entry level staff (management trainees, assistant managers etc.) based in the IBC buildings, working in different departments, i.e. billing and complaints. The interviews with these management trainees and assistant managers were done after the researcher successfully built a rapport with them during non-participation observation. The interviews, conducted at various levels of the hierarchy, provided the researcher with an identification of the different mechanisms at play within each level of the hierarchy. A list of interviews carried out within and outside the company can be seen in Table 3.7.

Table 3.7 Hierarchy of Interviewees

Managerial Hierarchy Level	Number of candidates interviewed (2013)	Number of candidates interviewed (2015)	Number of repeated interviews
Top mangement	04	02	02
Upper middle management (GM and DGM)	07	05	04
Middle management (managers, assistant managers, management trainees)	05	7	05
Staff (from billing, complaints and accounting department) First point of contact for customers Customer service people Record keeping, data entry.	04	11	7
Customers	-----	15	None
Total number of interviews	20	40	18

Source: Prepared by the author

Outside the company, the customers of K-Electric were interviewed with the intention of un-covering similar mechanisms. In order to be able to enhance the credibility of the claims, the respondents (customers) were selected carefully. The researcher ensured participation from different social classes and neighborhoods. The selection and classification of K-Electric cus-tomers is presented in Table 3.8.

Table 3.8 Classification of Customer Interviews

Areas where customer interviews were conducted	Number of interviews conducted
High income areas (affluent neighbourhoods)	04
Middle income neighbourhoods	04
Low income neighbourhoods	07

Source: prepared by the author

Lastly, while conducting interviews within the company, the researcher had the opportunity to carry out non-participant observation that was not otherwise planned. The non-participant observation enabled the researcher to have a closer look at the actors', i.e. the company employees', interaction with each other, with the customers and, more importantly, with the SAP system. This non-participant observation is explained in detail in the later section of this thesis.

3.7 Case Study Creation

It is important to discuss at the outset of this section that the case study research design is not restricted in its use of any one research approach and can be used for both qualitative and quantitative inquiry (Yin, 2009). However, despite their use in both qualitative and quantitative studies, case studies are often widely criticised with a supposition that the findings from a case study cannot be generalised due to their context-specific nature (Bryman, 1989). It is also assumed that case studies can only be partially helpful during the exploratory phase of a research project in setting up a hypothesis that can later on be used to generate more rigorous information. Ackroyd & Karlsson (2014) argue that such an understanding of the utility of the case study research design is problematic, mainly because some of the widely acknowledged research works (see for example Burawoy's 1979 work) adopt the case study approach. In another instance it is observed that many valuable pieces of research work carry out a

comparative analysis of the already published case studies belonging to the same tradition in order to establish their view point.

It is therefore stressed that in order to acknowledge the research findings of these informative research works, we need to change the traditional perception of case studies and attempt to explore how case studies can be effective (Ackroyd & Karlsson, 2014). This follows the understanding that in creating a case study, its scope should not be narrowed down to studying a single organisation; instead, a case study should be approached and put together with an aim to explore/illustrate more general concepts such as understanding a management system – totalitarian, authoritarian etc.– or a specific economic system and so on. The perception of case studies, in this way, allows greater possibilities for generalisation of the findings.

For a CR researcher, what's more important is to pinpoint the successive order of the causal mechanisms at play (Ackroyd & Karlsson, 2014). It is for this reason that Yin (2003: p. 05) suggests the selection of the case study design if a research posts many 'how' and 'why' type questions. This is because the very nature of both 'how' and 'why' is exploratory and seeks explanations for various causal mechanisms that are in place. For Flyvbjerg (2006), case studies can be more credible because they remove the geographical distance between the researcher and the social phenomenon that is being studied. This physical proximity with the object of the study provides the researcher with a chance to observe events more closely, and presents a very good opportunity in terms of theory building. Further, Flyvbjerg (2006) views case studies to be effective because they depict a 'real life' event and are embedded in a real life context. A similar view is shared by Ackroyd & Karlsson (2014) –case studies are particularly helpful in investigating these successions through their recognition of the context in which these particular causal mechanisms can be located and investigated. The purpose of the researcher is to highlight the 'formative process' that shapes specific outcomes when they are at play, and which can be best known when observed from as near as possible. For a CR researcher, a case study, under this situation, provides an opportunity to understand the process of the interplay of mechanisms, either completely or partially. Especially when a researcher has little control over 'participant behavioural events' and when the research mainly focuses on the contemporary/present set of events. In this case, it is suggested that case studies are good at gaining a deep and thorough understanding of these events (Yin, 2009). The research topic of this thesis is in line with these requirements, mainly because it asks why it is important to study the wider context surrounding technology and organisations. Moreover, in order

to answer these questions, this research relies on observing the causal mechanisms that have shaped the events that have taken place at an empirical level, in the real life context.

This is, however, not to deny that ‘mechanisms cannot be directly observed. In fact, their idealised characterisation is created using intuition to interpret the available evidence’ (Ackroyd & Karlsson, 2014: p. 24). This is because it’s only the process, which shapes different outcomes at an empirical level, which can be observed. Following the identification of various mechanisms, more research questions get shaped as the researcher thinks about how this known mechanism has come into being (Ackroyd & Karlsson, 2014). Thus, retroduding – tracing back the existence of this recently known mechanism, widens the ‘scope of a case study research’.

The notion of realist research being substandard or lacking value, only because it utilises the case study research design, needs to be set aside. As opposed to the positivist viewpoint, it is actually a well selected and well created case that sets the way for scientific information to be developed and not the application of statistical methods (Ackroyd & Karlsson, 2014). Especially, research in the field of bio-medicine relies heavily on how truthfully a key mechanism has been described. This is important because until and unless the causal mechanisms (e.g. that cause a disease) are known, the statistical methods cannot be utilised and, if utilised, can be misleading due to the lack of ‘theoretical warrant’. Similarly, within my research area, many studies tend to utilise case studies as a viable research strategy to uncover important causal mechanisms. Various journals are replete with studies focusing on the transfer of technologies internationally (mainly in developing/emerging economies) and analysing the impact of wider socio-economic structures on such transfer process. For example, the journal, ICT4D (Information and Communication Technologies 4 Development), focuses only on technologies and the wider context in which they are embedded. Most of the studies published within this area will adopt a case study research design to illustrate the dynamic between the individual and organisational levels of analyses. As a specific example, Puri’s (2007) work on ‘how technologies are embedded in the wider socio-economic context’ uses the case study approach to tell the tale of the implementation of the GIS (Geographical Information System) technology in the rural areas of India, and the socio-economic forces in place that affect the implementation of the process in not just one but many ways. These are but a few examples of the case studies taken from my research area. They point out the situations under which the case study approach yields the best results. Most importantly, case

study methods allow authors to trace how larger environments affect individual and organisational behaviour in time and space (Yin, 2009).

The importance of the case study research design is therefore emphasised as, given some degree of isolation, it provides a context in which certain mechanisms can be studied (Ackroyd & Karlsson, 2014). However, as discussed above, it is important to note that the case study approach, being an important research method, is not the only research method followed by CR researchers. CR researchers can follow any method available.

3.7.1 Retroductive Case Study

CR researchers not only use different research methods to seek insights on a research topic; they can also choose from across the range of the case study research designs that are developed in different ways to serve the purpose of the inquiry. These different types of research design, depending on how extensive or intensive the case study is, are given in table 3.9 of this chapter. Ackroyd & Karlsson (2014, p. 25-26) stress that although case studies are linked with intensive research, case studies can be either intensive (focused on identifying generative mechanisms) or extensive (focused on studying the context in which these mechanisms are known to exist). On the other hand, case studies can also be utilised for abduction or retroduction methods, depending on the principle of ‘the logic of discovery’ (p. 26). For example, a simple case study, e.g. one that reveals how a mechanism operates, can be assumed to have a context that is in a state of inertia; hence, it pays greater attention to the process of the operation of mechanisms only. In contrast, a researcher can select a research design that focuses on defining the results (outcomes) in relation to the degree to which these results (as produced through generative process) are shaped (even if to a minimal level) by the context in which they exist and operate. It is in this second case that the researcher can post retroductive questions such as what might have allowed a generative mechanism to cause certain outcomes and not others. This type of research design serves a distinctive explanatory purpose and thus moves the research in an extensive context-driven dimension. Furthermore, it emphasises that context plays an important role in shaping mechanisms even if the role of the context is not fully visible. However, the extent to which the context impacts the mechanisms may vary (Ackroyd & Karlsson, 2014).

This research project chooses a retroductive case study research design because context plays an important, if not decisive, role in shaping mechanisms that further interact to produce and reproduce specific outcomes. For example, the economic instability in Pakistan was a major reason behind the intervention of the supranational bodies in the policy making of the country. This mechanism of intervention (as discussed in detail in Chapter 4) then triggered the privatisation of K-Electric and the implementation of the SAP technology that followed soon after the takeover of operations by the new management. Both the interviews and observation required to develop a case study involved visiting several sites, as K-Electric has 28 business units (IBCs) located across Karachi. During interviews and observation, the interviewer was able to observe various outcomes arising from the different ways in which the same technology was used at IBCs. The varying outcomes were not only observed within the organisation, but also outside the organisation, where customer experiences were vastly different depending on their encounter with the organisation.

While any data would reveal a number of affordances, those underpinning/revealing the organisational change as it took place would be best known through the examination of real-life occurrences that emerged over time. Since the majority of data for the case study comes from the interviews, specifically from answers to questions about the concrete outcomes of using the SAP system, the researcher was able to retroduce IT related affordances from the data. However, pre-implementation data was collected as part of the research project in order to understand the background of SAP implementation. The main focus, however, was to explore and extract the post SAP implementation changes within the various IBCs of K-Electric once it went live.

In total, three case study chapters were created using both primary and secondary data. Since the wider economic-political context was identified as an important background, but not directly associated with K-Electric's post SAP performance, the context setting chapter was written using the secondary data. On the other hand, the chapter on SAP technology, its various components and what functionalities it provided, was mainly written using the notes prepared during non-participant observation and interviews with managerial staff, in addition to information on the workings of SAP technology. Finally, the case study chapter on the role of the regulator and increased dissatisfaction among consumers was written using both secondary and primary data. For instance, the factual data outlining the tariff rates, governmental subsidies to the utility and both previous and ongoing NEPRA cases against K-Electric were based

on the information provided by NEPRA officials. On the other hand, the section on customer concerns, opinions and experiences was mostly written using direct quotes taken from the interviews. In what follows, a detailed discussion of the research methods adopted for the creation of the case study, semi-structured interviews, textual data, and non-participant observation, are provided.

Table 3.9 Eight Designs Relevant to Realist-Informed Research

Distinctive Research Strategies				
Intensive \leftrightarrow Extensive				
	What is the mechanism	How do context and mechanism		What is the context?
	(Context as given)	Typically interact	Historically intersect	(Mechanisms Inferred)
Research Procedures:				
Detached study	Case studies(1)	Comparative case analysis(2)	Generative institutional analysis(3)	Research survey and census data(4)
Engaged Study	Action study	Intensive Realistic evaluation	Barefoot historical research(7)	Extensive realist evaluation(8)
Dominant logic of discovery	Abduction	Abduction	Abduction/ Retroduction	Abduction/ Retroduction

Source: Reproduced from Ackroyd & Karlsson, 2014: p. 27

In the following section each method used in the creation of the case study of K-Electric is described in detail.

3.8 Research Methods

3.8.1 Textual Data

Although this research implies that the reality of the world exists irrespective of its human and social constructions, it also acknowledges that there are some socially constructed aspects of that reality. As suggested by Atkinson & Coffey (2004), the process of documenting facts does not necessarily represent the reality of the world, it rather records the events that are a result of the social construction (p. 73). Contrary to the constructivist view point that stresses that there is no truth in texts, a CR researcher would analyse the text to explore, firstly, what the text says about the ‘truths’ of its writers (i.e. their perspective) and, secondly, what one can retroduce from this text about the mechanisms and context at play.

Following the CR account of textual data, the actual writers, along with the targeted and implied readers, were identified to better understand the socially formulated aspects of the textual data. In creating the case study of K-Electric, textual data sets, ranging from joint annual reports of the IMF and the World Bank to the court orders and press releases of the regulatory authority, NEPRA, and from financial reports of K-Electric (both before and after the privatisation) to articles published in newspapers, and even the data taken from the online complaints board of K-Electric, were used to seek answers to the research questions. As an important consideration of the textual data analysis, the readership and targeted audience of each type of text was identified subsequently. It was noted that the reports of the World Bank and IMF duo were mainly written for the information and consideration of the state officials, whereas the instructions (court orders, press releases) from NEPRA directly addressed the management of K-Electric. On the other hand, the newspaper articles actively and simultaneously voiced critique and appreciation to inform the customers of Karachi about the changes within the power sector in general and within K-Electric in particular. These varying forms of textual data were then used to retroduce important mechanisms that related to the author’s research topic.

The procedure for choosing the newspaper articles included entering keywords into search engines, mainly Google scholar and customised library catalogues made available by the researcher’s institute offering information relating to the researcher’s interest. The following keywords were used to search information-specific articles: KESC (former name of K-Electric), Privatisation of K-Electric, IMF, World Bank and privatisation of K-Electric,

Abraaj Capital, SAP technology, advanced billing, advanced metering, etc. The articles that resulted from this search were further examined to check their suitability vis-a-vis the research project, and those considered irrelevant were physically excluded. The relevant articles were read carefully not just to better understand the series of post privatisation events, but also to connect them so that a bigger picture could be drawn. The examination of these articles provided useful insight in developing a macro-economic picture where the role of the government, the IMF, World Bank, and IFC was located. The review of the articles also sketched a micro-level organisational picture, where the influence of the foreign management, i.e. of Abraaj Capital, was rendered visible.

Another major source of important information about K-Electric has been the internal documents (company reports, minutes of meetings, etc.) that were requested from senior managers once a rapport was built with them during the interview sessions. The internal company magazine, named 'Azm', had also been a major source for tracing the starting dates of various post-privatisation changes within the company. These magazines were retrieved from the company's official website.

Lastly, the researcher contacted many officials from NEPRA, the regulatory authority looking after K-Electric's operations, to gather data about the information and communication flow between NEPRA and K-Electric. Around 50 e-mails were sent requesting information and, due to the lack of response, some gentle reminders were also sent. But, the overall response rate was very low, with only 5 contacts responding back. However, these 5 contacts provided useful links, printed material and official documents outlining the communication between NEPRA and K-Electric.

As the research project was still in an exploratory phase, these multiple textual data sources were combined to track important themes emerging from them. Following this practice, several important themes were identified: the vested interest of the macro-economic players in the privatisation of the power sector, the company's interests in the implementation of SAP, the company employees' perception of SAP, the customers' perception of K-Electric and, finally, the interplay of these aspects at various levels. The emergence of these themes shaped the focus of the research project towards exploring the impact of the SAP technology within and outside the boundaries of K-Electric in detail. As a result, a more concentrated/focused

textual data analysis was performed. Additionally, as the research focus became clear, the textual data laid the foundation of the interview questions the researcher needed to ask.

3.8.2 CR Approach to Interviewing

Although positivists, constructionists and critical realists have their own accounts of the construction and conduct of interviews, this thesis, using CR concepts, is mainly concerned with the ‘design, conduct and analysis’ of a social research interview from a CR point of view.

Positivists, however, call for a tighter control of both the context (interview setting) and content (interview questions) in order to carry out the research agenda in an unbiased manner (O’Connell Davison 1994, p. 17-21). In contrast, critical realists acknowledge the value of the process of dialogue (between human actors) and the construction of meaning as a result of it. However, ‘critical realists seek to utilise interviews ... both to appreciate the interpretations of their informants and to analyse the social contexts, constraints and resources within which those informants act (Smith & Elger, 2014, p. 111).

1. Theory Driven Interviewing

In contrast to positivists’ accounts of interviewing, Pawson and Tilley (1997) draw on Bhaskar’s (1975 & 1979) CR perspective of inquiry and theorisation to propose an alternative approach to interviewing. They utilise the CR perspective (for the purpose of data collection) in order to inquire about the relationship of various causal mechanisms (including how the actors perceive these actions), the dynamic context in which these mechanisms work, and the outcomes that they produce (whether expected or unexpected). This approach to interviewing resonates well with the ‘ontological depth’ offered by a CR perspective, which asserts that the reality of the social world exists in layers and these layers are interconnected to each other, and in order to seek knowledge of any social phenomenon, these layers must be uncovered and investigated (Pawson, 1996: p. 301).

The theory-driven interviewing technique is also in line with the retroductive approach, selected to underpin the researcher’s subject area. It implies that the interviewer is knowledgeable about the ‘topic of inquiry’, and thus actively seeks evidence in order to ‘confirm, falsify and refine’ the a priori hypothesis (Smith & Elger, 2014). Being knowledgeable about the

issue being investigated does put the interviewer in the front seat, but not with an aim to suppress the informant. From the CR perspective, this is to be treated as a situation where both the interviewer and the informant are the bearers of different types of knowledge, and where the interviewer is proficient in ‘characterising wider contexts and the outcomes of actions’; on the other hand, the informant’s proficiency lies in explaining mechanisms that contribute to social change through reasoning. For instance, although the interviewer was already knowledgeable about the post SAP implementation impact of K-Electric on its customers after a review of the literature, the informants’ answers helped the researcher in uncovering the mechanisms that had logically shaped the differential impact (both negative and positive) of SAP on different societal groups.

In the interviewing process, the interviewer works as a coach and guides the interviewee through the sequential questions aimed at raising relevant queries/issues in order to gather the information needed/required for the research (Smith & Elger, 2014). Critical realists acknowledge that the interaction of an interviewer and an informant is influenced by the research motivation of the researcher, but their main concern is gathering rich details of events, experiences, and the whole process, because these rich descriptions provide insights into causal mechanisms that operate at various levels of social reality. An interview interaction, therefore, must be informed by an analytical framework consisting of guiding questions and making further discussions to generate in-depth knowledge of complex concepts, to yield a response.

2. Informant Expertise and Selection of Interviewees

Interviewee selection was carried out following the categorisation process, outlined by Pawson and Tilley (1997), which divides informants into 2 categories: practitioners, and subjects. For Pawson and Tilley, ‘practitioners are seen as having expert knowledge about the ways in which particular policies have been implemented, the challenges and opportunities involved, and their immediate influences on the outcome, including putative success or failure’ (1997: p. 120). Practitioners thus include senior managers who formulate different policies, decide what modes of operation are to be followed, which strategy to use etc. Hence, at the practitioner level, a total of six interviews were conducted (during two visits, one in 2013, and another 2015) with the top management (senior executives). These informants provided useful information regarding matters such as why the decision to implement SAP technology was made by the management, and how SAP was first tested in selected IBCs before going live

across other business units of K-electric. The senior management also shared their knowledge of how the funding was arranged to support the organisation wide implementation of the SAP system and other compatible supporting technologies that the management was planning to implement (details of which will be discussed in Chapter 5).

Pawson and Tilley (1997) further argue that senior managers may have broad knowledge about how the organisation operates, what policies are in place, and what future developments the management are planning, however, they may not necessarily know every single detail of what is going on in different departments. To overcome this issue, the researcher not only conducted interviews with District General Managers (DGM), General Managers (GM), managers and assistant managers of different IBCs of K-Electric, all of whom were responsible for looking after the business operations of their assigned business units, alongside having first-hand experience of working on the SAP system, but also with what Pawson and Tilley refer to as 'subjects'. According to them, the subjects can share their own experiences of working on policies and programs that are often developed by other practitioners. Subjects are a good choice for interviews, especially when the researcher wants to explore the outcome or impact of policies and programs designed for these employees. Since the purpose of this research is to focus on post SAP implementation changes, the interviews were mostly conducted with employees working under the SAP system. A total of 15 interviews were conducted with staff working in various departments within different business units. During the interviews these subjects provided details on the functioning of different components of SAP; for instance, the staff in the billing department actually showed the researcher (by using the SAP system on the computer) how the average was calculated in order to issue monthly bills. These kinds of details helped the researcher (belonging to a non-technical field) especially in getting to know the design and functionality of SAP, and thus creating a well-informed case study.

One of the unique offerings/research contribution of this study is to elaborate on the various impacts of the same technology on customers belonging to different societal groups (affluent, middle income and low income, respectively). To accomplish this task, 15 interviews were conducted with customers to determine the differential impact of SAP technology (as facilitated by the differential use of technology by the management) on various customer groups. The classification of these customer interviews is explained in Table 3.8. The customer interviews thus provided great value in aiding understanding of how SAP technology's various

functions were actualised by the organisational actors (affordances actualised by managers and employees) depending on the location of various IBCs and the neighbourhoods served by them.

3. Interview Data

The researcher selected semi-structured interviews due to the relatively clear research direction of the project. The nature of the research was such that it required specific questions to be asked while allowing the respondents to add as many details as they liked. Following the format of semi-structured interviews, the researcher made a list of coherent questions in order to keep the conversation focused and to obtain meaningful responses. These questions were transcendental in nature and were informed by the related literature. However, the sequence of these questions was often altered depending upon the flow of communication and ideas (Saunders et al., 2009). This loosely defined interview format helped because the respondents also shared some new dimensions, related to this research topic, that the researcher did not come across before, and which later on proved to be extremely important in answering the research questions (Alvesson & Deetz, 2000). For instance, when the researcher tried to probe into the impact of the technological change brought forward by K-Electric, the respondents shared different experiences regarding this. The respondents, that included both organisational and non-organizational actors (customers), attached different meanings (both negative and positive) to their experiences of the organisational change. To extract meaning from the interview data, it was important to consider the process of social construction. Following which, it was observed that within an organisational context, employees (even if only apparently) were more welcoming of the organisational decision to implement SAP. On the other hand, customers (although unaware of the type of technology used by K-Electric) in favour of the new management policies were from areas where the power supply was uninterrupted, thus displaying improved performance, and those resisting the new management were from areas that underwent unscheduled power cuts and long waiting times to address faults. It was therefore determined that relying on one data source can raise issues of reliability.

4. Semi-Structured Interviews

The sampling technique followed by this study is inspired by the concept of theoretical sampling. Theoretical sampling, as used in qualitative methods, aims to respond to data findings rather than establishing a data frame before the research begins (Corbin & Strauss, 2008).

Following Corbin & Strauss's explanation of theoretical sampling, the data analysis begins as soon as the first interview takes place. The data collected was further investigated to extract important themes and potential mechanisms that had been identified through the literature (published material on the company). These themes then directed and shaped the research questions. The answers obtained from those questions laid the way for more data to be collected so that the researcher could extract more knowledge about these emerging themes. Corbin & Strauss (2008: p. 144-145) assert that this process of questioning and re-questioning continues until the research hits a 'saturation point', that is, when all the research themes interconnect and start making sense as well-defined elements.

As stated earlier, this research project was of an exploratory nature, with, initially, only a potential research site and K-Electric's post privatisation changes in mind. This was followed by a trip by the researcher to Pakistan, where the researcher conducted 20 exploratory interviews with management and employees based at K-Electric's different IBCs. These interviews asked very simple questions, with most of them seeking to explore the post-privatisation changes within the company in order to grasp important themes. The interview transcripts from both trips, as conducted within the organisation (with senior managers and other employees) and with customers, are given in appendix 2 of this thesis. For instance, sample questions drawn from this procedure included the following questions:

- What role did the IMF or World Bank play in the privatisation of K-Electric?
- What was the impact of the privatisation on K-Electric's day to day business operations?
- What immediate changes were introduced after the privatisation of the company?

It should be noted here that these interviews were being conducted at the same time the textual data sources were being explored to find important themes. Initial interview findings suggested that the respondents mainly connected the post-privatisation changes within the company with two major shifts: the opening of Integrated Business Centers, which was considered to be a major post-privatisation move in the company's operations, following which the company was providing a single-centre for 'customer dispute resolution' management. The IBCs worked as separate offices located within different areas of Karachi. Details of the IBCs and their working pattern can be found in Chapter 4. Secondly, a major change follow-

ing the privatisation was the implementation of the SAP technology used to integrate all business operations and IBCs of K-Electric.

This was followed by another trip 18 months later, when the exploratory phase of the project was over and when analysis of the earlier data clarified the research focus. This time around, the questions were more focused on the SAP technology and how it affected, and was understood by, various groups in society and the company. This allowed a larger target for interviewing that involved the company's senior and middle level management, as well as the employees. To ensure that the case study explored both sides of the picture, interviews were also conducted with the customers of K-Electric. Once again, in order to avoid any bias, the respondent (customers) were carefully selected and the researcher ensured the inclusion of respondents belonging to different areas of Karachi, in order to cover the perspective of all social classes (upper, middle and lower) in the analysis.

All interview questions were aimed at general inquiry with a very flexible approach, only giving direction to the discussion. Each of the main questions was decomposed into 2 or 3 sub-questions to give the respondents a clear idea of what was being asked, so that they could share the right experiences with the interviewer. Additionally, the interview questions were treated more like a guideline rather than a strict format that must be followed. This allowed the researcher to modify, change, add or delete any questions during the interview to gather as much information as possible.

5. Interview Practices

A total of 60 interviews were conducted with 42 respondents for this research project. Each interview was of a duration ranging from 45 minutes to 1 hour and 20 minutes. All the interviews were tape-recorded and transcribed. The researcher followed strict guidelines issued by Cardiff University before conducting the interviews. The researcher provided each respondent with a confidentiality agreement that outlined the researcher's intentions to treat all the information with confidentiality and to respect and maintain the anonymity of the respondent. According to the specified agreement, the respondents were also given the right to opt out of the interview if they were not satisfied with the interview questions being asked or due to trust-deficit issues.

As stated above, the interview data was gathered at two different times. The first set of interviews focused entirely on the post-privatisation changes within K-Electric and probing the influence of the IMF in the privatisation process. The next data collection trip was more focused on exploring the implementation of the SAP technology within the company and the impact of this technological change on the wider social structures. However, the second set of interviews had a follow-up session with the previous interviewees from within the company. The follow-up interviews had more specific questions about the SAP technology and proved to be more fruitful, not least because a good rapport with the employees had already been established during the 1st data collection trip, but also because in the first round of interviews the researcher had already sought permission for follow-ups in case the research focus shifted or more prominent themes emerged. As a result, 18 respondents were approached and duly re-interviewed with revised questions. The number of repeated interviews within each level is given in Table 3.7.

All of the interviews were conducted in the city of Karachi, as the company is only responsible for the supply of electricity to the Karachi region along with a few areas on the outskirts. I visited 18 out of 60 respondents twice with a follow-up interview. As Legard et al. (2003) suggest, tape-recording the interview conversations is a good way to preserve the language used by the respondents. Put simply, the tape recording provides a chance not only to go back to check what a respondent had said, but also to recall how exactly the respondent put together what they said. This is because respondents tend to indicate subtle nuances of their opinion in the way answers are given. It was also reflected in the tape recording that the respondents became excited and enthusiastic while talking about something they considered to be of value. The recordings also had expressions of “ummm”, “well” etc., as the respondents were struggling to voice/share their experiences; this was particularly observed when a complex question was asked. These expressions gave me an insight into the perception of the respondents regarding different aspects of the social phenomenon under inquiry. A few respondents started speaking very slowly and looked here and there while answering the questions. This body movement also helped the researcher in identifying oppressive mechanisms at play in these situations which made the informants respond in a particular way.

In a few cases I was not allowed to tape record the interview, either due to my inability to establish trust with the respondent or due to the surroundings in which the interview was being conducted. For instance, I did some interviews with the staff in the complaints department

with people sitting on the reception desk and dealing with customers' complaints face to face. These employees were not comfortable with having their answers recorded as they were talking to customers at regular intervals during the interview session. After the interviews had been conducted, I sent the transcripts to all my respondents to see if I had represented their intentions in the correct manner. Most of the interviewees made corrections where they had issues with my transcription. All interviews with respondents from the company were conducted at the work place. Whereas interviews with the customers of the company were held at different locations including their homes, coffee shops, and even in shopping malls, keeping in mind their preference and availability.

3.8.3 Non-participant Observation

The selection of observation technique was not planned but, during both the data collection trips, the researcher had the opportunity to observe the behaviour and working pattern of the employees at the research site (the different IBC offices of K-Electric). The opportunity to observe the events arose due to the interview schedule where the researcher, most of the time, had one interview early in the morning and the other at the end of the office time. Due to the distance between the research sites, and the researcher's arranged accommodation, the researcher was permitted by the company to sit and wait in the office for the second interview instead of leaving and returning for the interview. Since both trips to Karachi were solely for purposes of data collection, and with no immediate family or friends in the city, the researcher requested permission from the IBC managers to visit and sit in different IBC branches during working hours (9 to 5), even when no interview was scheduled for the day. The span of non-participant observation covered a period of two months. In these two months of observation, the researchers made notes of everything that appeared to be of interest and relevance to the topic.

While waiting for the second interview and during the random visits, the researcher would sometimes sit with the staff at the complaints handling desk or 'hot desk'. At the complaints handling desk, the employees used to file and record the customers' complaints face-to-face. This gave the interviewer an opportunity to observe the communication between the employees and the customers, and the employee's interaction with the SAP's e-complaint handling function. This observation hinted at several discrepancies/irregularities within the re-

researcher's data set. For instance, during the interview sessions, the interviewer was told that the company followed the automated processes of complaints handling as initiated after the implementation of the SAP technology. Following the SAP protocol, the customers were issued a machine-generated complaint token number and, upon their arrival, were placed in a queue to be served in turn. However, it was noted that a few customers were served before their turn came, because of their acquaintance with the members of the staff. The observation of these events revealed that the employees used the e-complaint function of SAP in several different ways, instead of just following the standardised method (as outlined by the management). Most of the complainants (customers) were organised in to a queue and dealt with in-turn, however, several customers received preferential treatment based on their relationship with the staff members. The researcher also got a chance to sit with billing department staff responsible for setting up and issuing monthly bills. The staff showed the researcher how the billing function was performed and how the bill was calculated using average billing function of the SAP. The researcher was also handed out a few paper bills to understand how different charges were put all together to determine a consumer's bill for a given month. This information about use of SAP technology in practice was deemed to be very useful in writing about the SAP technology and its various components including billing, invoicing, and CRM. The details about working of different functions of SAP as provided in chapter 5 of this thesis is mainly compiled from the notes taken during the non-participant observation.

Furthermore, the researcher observed that the majority of the customers had the same issue of being overcharged (over-billing) by the company, and of not receiving any satisfactory response regarding this issue. The observation of this activity proved to be useful in two ways: first, it hinted at the staff's lack of understanding of SAP's components, given their inability to take action (other than record the complaint) in response to overbilling. The members of staff would keep the complainants waiting for the officers in charge of dealing with the issue. Second, the researcher understood the company's routine process of dealing with the customers and gained first-hand experience of the customers' problems that were related to the implementation of SAP. Experiencing these problems helped the researcher identify that customers constituted an important dimension of the case study, hence, the customer's perspective was also taken into account.

During visits, the researcher was also made to sit with the staff of the company in their joint offices. It was noted that, contrary to the claims made during the interviews, the technology

was used to centralise communication and information sharing across all IBCs. The employees still liked to discuss all their office related issues with each other in groups. Even in the short tea breaks or the lunch break, all employees would sit together and discuss company matters and ask each other for help/opinion in case of a problem. Once again, these observations unveiled that due to presence of ‘strong traditional patterns of communications’, the SAP was not being fully utilized for the information sharing and storage. The employees preferred face to face communication over the computerised alternative offered by the SAP system. Secondly, this observation also contradicted the interview data, where most of the employees told the researcher that they preferred electronic communication, used e-mails to discuss any issue and share information. This contradictory observation also helped the researcher in uncovering the reality that the employees avoided being vocal about their preferred means of communication, mainly because it contradicted that chosen by the organisation.

As the researcher visited the IBC offices on a daily basis (in both data collection trips to Pakistan), a good rapport with the younger employees working in the IBC offices was built. The researcher would sit with the same employees on their lunch break, where they would discuss how they and their senior managers were made to sit in the office for long hours after the implementation of SAP. The normal office hours were 9am to 5 pm, but the managers and employees would arrive at 6 am and usually left for home at around 11 pm, as the company arranged extensive training sessions to train employees on SAP technology and its functionality.

The non-participant observation thus proved to be extremely useful, especially in identifying the realistic use of SAP and its various components that was otherwise not being pronounced publically. The observations made during this activity were utilised to create a well-informed case study.

3.9 Conclusion

The research design of this thesis was mainly influenced by the ontological and epistemological considerations of the researcher, in which organisational and non-organisational actors and their interactions with the technology provide real insights that underpin the IT-enabled change stories. It was therefore deemed necessary to interact with the non-

organisational actors in order to understand their perception of day to day, routine experiences (Silverman, 2011). Throughout the research, focus was placed on uncovering the multiple layers of reality existing within K-Electric, the SAP technology, and society. The entire research process was treated with caution, in order to keep the subjective reality in approximation of the objective reality (Ackroyd & Karlsson, 2013).

Another important aspect of the research design, as adopted in this thesis, was the selection of Bygstad et al's (2016) CR informed retroductive data analysis approach, as opposed to the selection of Bhaskar's retroductive analysis. Once again, the selection of Bygstad's account of CR informed approach was a deliberate act, as it widened Bhaskar's take on retroduction. It is argued that Bhaskar is much more focused on the analysis (rather than a whole method as presented in Bygstad's work), and comprises a causal analysis of events, a theoretical re-description of the components, the identification of mechanisms and affordances, and the elimination of alternative causes.

The chapter adopted the following format. Firstly, the ontological stand point of this research was spelled out. This was followed by the CR informed analysis, at this stage, the researcher created a table to represent the chronological occurrence of major events. This table was used to identify causal mechanisms and affordances at three important levels: organisational (K-Electric), technological (the SAP system), and the societal. Furthermore, the role of human agency in maintaining and guiding the interplay of these structural entities was explored. Secondly, the sources of information used to develop this thesis were outlined. At this stage, the selection of the research site and appropriate methodology was explained. To carry out the research, textual data, theory driven semi-structured interviews, and non-participant observation were adopted to gather information about K-Electric, its decision to implement the SAP technology and the different ways in which it impacted society. These data sources were selected not only because they were compatible with the researcher's questions, but also because they provided the richness needed to develop a strong evidence based case study. Finally, throughout the research project, the researcher kept moving back and forth between the theoretical concepts and the empirical findings.

Chapter 4: K-Electric and the Wider Socio-Economic Context

4.1 Introduction

The aim of this thesis is to extend the socio-material theorisation by including society in the studies of organisation and technology. We suggest that the role of society can be best understood by locating it in its wider socio-economic context. In this regard this chapter focuses on studying the K-Electric company in relation to its wider socio-economic context. To serve this purpose, this chapter focuses on exploring how the privatisation of one of Pakistan's leading electricity providing companies, K-Electric Limited, was embedded in the economic context of Pakistan. We believe doing so would help understand how and why certain events took place in the post privatisation period. It was noted that the privatisation of state owned entities has been a recent development in Pakistan, where the government's move towards a privatised business model is influenced by substantial dominance of macro-economic actors (i.e. the IMF and World Bank). In return for a conditional loan given to Pakistan, these economic players exert influence in reshaping the state level policy and decision making framework. It is argued that the privatisation of the K-Electric company presents a case of 'power practices' performed by the network of elites (i.e. macro-economic actors, international institutes, and the government). These elites are residual within authoritative/power structures that are embedded in the economic context (at the macro as well as micro level) of Pakistan. This chapter highlights the dependence of the Pakistani government on macro-economic actors, of NEPRA on the government, and of K-Electric on both the government and its newly appointed foreign management. It will be discussed how this interdependency of an elite network shapes the policies and processes-framework that K-Electric follows in the post-privatisation period.

This chapter also discusses in detail the post-privatisation scenario of K-Electric that, soon after its resale, underwent a drastic institutional change. The changes that took place at all levels within the organisation ranged from import of top management from outside the country to a major operational shift in the way the company had originally been operating for years (sustainability report, 2009-12). The major post-privatisation changes within K-Electric

included the opening of IBCs (Integrated Business Centres) by the company, with an explicit focus to modernise its routine operations by bringing about major structural, cultural and technological changes largely influenced by Western business models.

This chapter argues that the company's newly appointed top management, in an attempt to improve the profitability of the utility, has transformed the existing processes of the company with extensive focus on implementing the corporate working mechanisms and technology that have, of late, been perceived as a trademark of Western business models. In so doing, the company has neglected the external societal factors within which it is embedded. Additionally, in implementing these self-proclaimed successful changes, the company has ignored the overall societal and cultural differences between Western economies and under-developed economies. We suggest that such transformation ignores the suitability/compatibility of Western business models (technology) with different societies/cultures. Throughout this chapter we argue that implementing new practices within the company alone cannot ensure a sustainable institutional change. It requires reforms at both organisational and societal levels.

4.2 Macroeconomic Situation (Interdependency Network)

The socio-economic development of Pakistan has been unfavourably compared to other countries mainly due to the political instability in the country (World Bank report, 2006). None of the democratically elected governments, barring the one elected in 2007, have ever been able to complete the constitutionally specified tenure. Previously elected governments in Pakistan were either 'dislodged by military coups or dismissed by pro-army presidents on charges of misrule and corruption' (Gul, 2013: na). Additionally, the significant increase in terrorist activities in the north west of Pakistan, ongoing tensions with neighboring countries (Afghanistan and India), and recent natural calamities such as earthquakes and floods have badly affected the country's progress (Lerner et al., 2012). Prospects of development were set back in the 1980s when Pakistan bolstered the US in its war against the Soviet invasion of Afghanistan. The war ended in 1989, but not before deteriorating Pakistan's relations with a large section of the Afghan population. In May 1998 Pakistan's nuclear testing operation further aggravated the situation by angering the west and leading to Pakistan's isolation. This led to the imposition of several economic sanctions, including restrictions on new lending (from international donor organisations), by G-7 countries (Pasha et al., 1999). New York's 2001 terrorist attacks, for which Pakistan was blamed along with several other countries, cre-

ated a negative image of Pakistan within the international community, and tensions grew further between Pakistan and the West. By that time, Pakistan came to be recognised as a fragile, unstable and insecure state that badly needed international financial help.

Considering Pakistan's weak economic, political, governance and security position, the macro-economic players that were initially hesitant, would only agree to enter into a conditional loan contract (Lerner et al., 2012). Consequently, Pakistan had no choice but to accept the debt agreement of 1997 under the ESAF/EFF (Enhanced Structural Adjustment Facility/Extended Fund Facility) program of the IMF and the World Bank. The ESAF program fundamentally offered a conditional loan to Pakistan, with the main conditions being the 'devaluation of Pakistani currency in international markets, imposition of GST (goods and services tax) liberalisation of imports and the curtailment of government expenditures' (Peter, 2011: p. 9-12). Signing the ESAF contract meant accepting the IMF's terms and conditions, thereby allowing a greater degree of IMF intervention in state-level policy making. The loan was released in instalments, and only upon successful implementation of the policies that the IMF had laid down. Besides the disbursement of the loan, IMF has been sending teams to review Pakistan's performance from time to time. If the teams were not satisfied that IMF conditions were being met, the loan would be postponed immediately. In the past, Pakistan failed to implement the IMF proposed strategies, e.g. in 1993 and 1999, resulting in the IMF walking out of the loan agreement and permanently suspending the ESAF program. Being on the verge of bankruptcy around that time, Pakistan again approached the IMF for help. Finally, the IMF agreed to enter into a standby agreement (SBA) subject to much tighter controls being applied and structural reforms being adopted by Pakistan (Lerner et al., 2012). Given Pakistan's economic instability, the government once again agreed to revive its debt agreement and accept the SBA.

The main conditions of the IMF agreement involved the abolition of subsidies, including exemptions and privileges, the increased role of private sector, competitive pricing of public utilities, raising electricity tariffs, widening the tax base, strengthening tax administration, and improved access of foreign investors to the oil and gas sector (Peter, 2011). The SBA program helped the IMF in exercising greater control in various sectors of Pakistan's economy, including the energy and banking sectors, taxation and public expenditure. Under the structural loan facility, the Pakistani government was forced to agree with the proposed policies and strategies-framework that the IMF, in collaboration with the World Bank, suggested

each year through a compiled written report on Pakistan's economic performance (Pasha et al., 1999). The report identifies the underperforming sectors of the economy followed by the suggestions from the IMF and the World Bank on how to improve the underperforming sectors of the economy.

The way the Pakistani institutions have changed over the years gives us an inkling of these macro-economic actors' strong influence on the government of Pakistan. Ever since the signing of the ESAF/ EFF treaty, the IMF and the World Bank's joint annual reports analysing the economy of Pakistan have been the prime source of change in Pakistani institutions and their activities. Every year, the IMF comes up with bundles of changes suggested ostensibly to improve the underperforming sectors of the Pakistani economy, and urges the country to act upon these suggestions at once (Waqas, 2013). Being a country in socio-political turmoil and in desperate need of foreign funding, the Pakistani government and high officials put all their effort into implementing the changes suggested by these actors.

4.3 The Privatisation of the Energy Sector

The concept of privatisation in Pakistan is relatively new and can be traced back to the early 90's (Chandio, 2013). Since its beginning, the history of privatisation in Pakistan and the overall societal reaction to privatisation has been complex. The idea has received severe criticism from the people of Pakistan, who consider privatisation as a threat to job security that was otherwise offered by the government sector. On the other hand, Pakistani academia and economists are still doubtful about the success of privatisation in Pakistan. Isran (quoted in Chandio, 2013: na) stresses that privatisation works in countries with "rule of law, accountability, transparency and availability of information to the people about market activity... but in Pakistan we don't have anything like that".

Since the idea of privatisation was introduced in Pakistan by the powerful macro-economic actors in return for the ESAF and SBA program, the nation saw a wave of privatisation in the 1990's, despite opposition (Pasha et al., 1999). From 1990 to 2008 a total of 167 SOEs (State Owned Entities) representing 98% of the total SOEs in banking, petroleum and energy sectors of the economy were privatised under the IMF's proposed privatisation strategy (Waqas, 2013). This extensive privatisation also resulted in Western influence being observed at a micro (organisational) level. The privatisation was followed by a change in the ownership of the

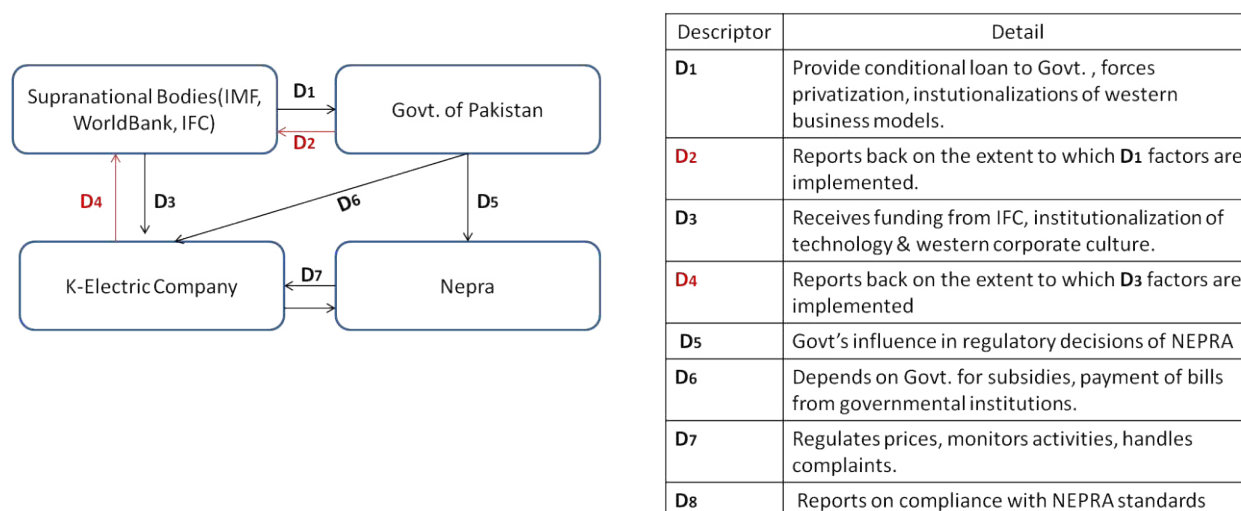
SOEs and the inclusion of investors from outside the country with Western educational backgrounds. These investors attempted to change the existing practices of these organisations with new methods of doing business that have of late been perceived as trademarks of private company operation (Herald, 2013). On one hand the IMF was using economic progress reports to influence government's macro level policy reforms, and on the other hand the use of discourse such as 'boosting efficiency and performance through private investment' and 'replacing obsolete technology with state of art facilities' was largely used to encourage privatisation and the adoption of technology to support business operations at the organisational level. The discursive change strategy helped the concept of privatisation appear viable and convincing because of its proclaimed threefold impact on Pakistan's economy, viz maintaining macro-economic stability in the state, alleviating poverty, and improving governance (World Bank report no. 20060). The government of Pakistan also used rhetoric to convince the population to accept the privatisation strategy, as Pakistan's Prime Minister has often-expressed his belief that government-owned organisations are incurring losses "because they are managed by government officials and could make a profit if managed by private owners" (Chandio, 2013: na).

The privatisation of state owned entities (SOEs) mainly in the banking and energy sector was one of the main conditions of the IMF imposed under the structural adjustment facility (Pasha et al, 1999). The IMF and World Bank duo have closely been watching and analysing the workings of the power sector as part of their proclaimed economic stability plan for the country (Peter, 2011). Pakistan's power sector has been badly affected by the state level crisis, and is one of the underperforming sectors of Pakistan's economy (Malik, 2012). Due to the severe energy crisis that emerged in the 1990's and the ever increasing blackouts, many companies have abandoned their operations in Pakistan and shifted to other countries in the region where the power supply is more stable and ensures uninterrupted business operations (Lerner et al., 2012). This situation has affected the overall economy of the country and the power sector has therefore been subject to tight scrutiny from the macro-economic actors. The newly laid policies outlined by the duo have greatly influenced the working of the power sector in one way or another. The state level policy, such as the devaluation of the rupee, that was acted upon at once, was actually demanded by the IMF (Ahmadani, 2013). The devaluation of currency caused an increase in input prices and fuel cost that resulted in higher energy prices being paid by consumers. Additionally, drastic cuts in subsidies for the power sector by the

government was another condition put forward by the IMF (see IMF country report 13/287, 2013), apparently to control governmental losses and to boost economic growth.

In recent years these macro-economic actors have imposed several sanctions on the energy sector, including the cessation of subsidies provided to the energy sector by the government, forcing the energy providing companies to hike their service rates and adopt new means of doing business to perform various routine operations in a seemingly efficient way (see World Bank report no 20060). The IMF and World Bank are major supporters of the implementation of the Western business models operating on a technological base (Herald, 2013). The macro-economic actors not only provide state level loans, but also allocated funds for private companies operating within the underperforming sectors of the economy (See World Bank group, 2012 for details). These industrial loans are used to support the cultural and technological restructuring of the companies. After the privatisation of the SOEs in Pakistan, international donor agencies like USAID, IFC and ADB have been funding many private projects, including funding for their infrastructural development and extensive training programs arranged for the employees to understand the new methods of working (See IFC, 2014 for example). Through aid money, these supranational bodies and donor agencies are influencing both the government and individual companies to change and reshape the ways in which they had, traditionally, been working, thereby forcing change. This interdependency network is elaborated in figure 4.1.

Figure 4.1: Inter-Dependency Network



Source: By the Author

4.4 The Case of K- Electric Company Karachi

The K-Electric Corporation was founded in 1913, and is the only vertically integrated utility in Pakistan that has been serving the Karachi region of today's Pakistan since before the partitioning of the Indo- Pak subcontinent. It was previously a state owned entity for almost a century (K-Electric, 2013). It was originally named Karachi Electricity Supply Company (KESC) but its name was recently changed to 'K- Electric Limited' in 2014 as part of a massive marketing and rebranding strategy to reposition the utility as being customer oriented (Shaikh, 2014). The company controls the production, transmission and distribution of electricity to the 10th most densely populated city in the world (KESC Newsletter, 2009). K-Electric has a monopoly on the production and supply of electricity not only in the Karachi region, but also on its outskirts, serving approximately 2.3 million consumers (EMPEA, 2011). The company also provides electricity to a few cities in the province of Balochistan (Hasan, 2014: II). K- Electric is the only utility registered at all stock exchange centres of Pakistan (Amlôt, 2014). The entity had not been performing well for several years due to various reasons including less investment in the infrastructure, corruption, and non-payment by both commercial and household consumers. The company had been consecutively incurring a net loss for 17 years from 1994 to 2011 (Shaikh, 2014).

The government has always supported energy providing companies, including K-Electric, by giving subsidies to support their operation so that consumers can have access to electricity at cheaper prices. However, the scenario changed when the government decided to privatise energy providing companies after succumbing to pressure from the IMF and the World Bank to privatise the energy sector of Pakistan (Herald, 2013). The IMF insisted that K- Electric had been seeing persistent recurring losses, and was thereby dependent on heavy government subsidies to support its routine operations. The government was facing increased pressure, particularly from the IMF, to get rid of K-Electric, labeled as a 'classic loss making enterprise' that was affecting the overall economic stability of Pakistan, and to minimise governmental losses that were having a negative impact on the economy of Pakistan. As a result, the two vertically integrated public-owned utilities that dominated the electricity sector in Pakistan, WAPDA (Water and Power Development Authority) and K- Electric, were privatised (Malik, 2007).

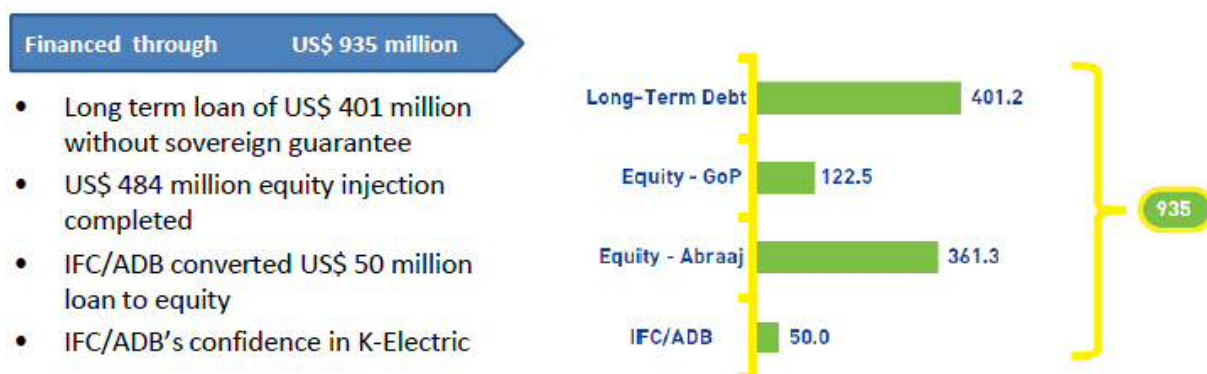
K-Electric was initially privatised in 2005 under the ‘proposed privatisation strategy’ recommended by the IMF in return for a bailout package, ranging from 5.3 billion to 7.3 billion dollars, given to Pakistan (Herald, 2013). The government sold a 72% share to a consortium of Saudi Al-jomaih companies and Kuwait’s national industry group, with the government retaining the remaining 26% share (Sher, 2008). Shortly after experiencing the challenges associated with the unstable socio-political environment of Pakistan they decided to withdraw their investment from the utility. In 2008, a proposal from Abraaj Capital, a leading private equity firm famous for investing in emerging markets, was accepted. Abraaj Capital took over K-Electric (KESC at that time) by acquiring a majority share. (EMPEA, 2011). Abraaj Capital invested in this underperforming entity to seek decent return from their total investment of \$ 361 million.

According to the privatisation agreement, Abraaj Capital was bound to handover control of K-electric to other investors once a decent profit had been made on the investment (Hasan, 2014: I). Most recently, Abraaj Capital announced their exit from the utility by the end of 2016, after earning profit for four consecutive years from 2012 to 2015 (Husain, 2015). The company announced that they were in talks with five potential buyers from the Middle East and China to take over control of the utility. It is argued here that the company’s motive to earn and show profit (through legal and illegal means) on the balance sheet was also influenced by their long term exit strategy, where investors would be easily attracted to investing in a profit generating venture.

After the privatisation of K-Electric, the International Finance Corporation (IFC), in collaboration with the Asian Development Bank (ADB), provided the majority of the restructuring budget for various projects of the company (Rizwi, 2014; Sustainability report, 2009-12). The funding structure of K-Electric is shown in figure 4.2. The IFC is a member of the World Bank group, whose vocal strategy for Pakistan is to encourage reforms and ensure provision of capital to the utility sector for regaining control over processes and reducing line losses’ (World Bank, 2014). Being a large global development institution, the IFC provides loan and advisory services exclusively to K-Electric in order to implement the structural and environmental reforms (Azm, 2012: I) demanded by the IFC. The IFC loans to private sector entities also come with conditions/suggestions supposedly on raising the working standards and encouraging innovation. The IFC, as part of its advisory services, works closely with clients

during the project cycle and ensures its suggestions are implemented (IFC, 2014). More recently, the IFC and ADB have invested a portion of their loan to obtain stakeholder status in the company. The duo has converted \$50 million from a total grant of \$275 million into equity investment (Azm, 2012: II).

Figure 4.2: Funding of K-Electric



Source: Rizwi, A. 2014, p. 10

4.5 The Governance Mechanism

While privatising the energy sector of Pakistan, in 1997 the government also established an independent regulator, NEPRA (National Electric Power Regulatory Authority) to monitor the activity of energy providing companies (Malik, 2007). As a result, NEPRA was established to serve as an independent institute that could monitor the activities of private energy providing companies, regulate energy prices, solve related issues, and handle complaints from both commercial and household consumers. Initially, NEPRA started working on the funding, amounting to Rs 100.5 million, provided by the federal government. Later on, NEPRA started funding its own operations from licensing fees and filling fees (Malik, 2007).

After the initial privatisation of K-Electric and the handover of management control to Abraaj Capital in 2008, the company started operations under the governance of NEPRA (Abbasi, 2011). K-Electric acquired its license for power generation and distribution from the power sector regulator (Sustainability report, 2009-12). Subsequently, K-Electric’s generation, transmission, and distribution operations are governed by the licensing agreement issued by NEPRA. K-Electric has a generation license for its service area until July 2018, and its distribution license expires in 2023. The distribution license is also contingent on meeting a num-

ber of service standards stipulated by the NEPRA Act of 1997, which describes the performance standards and financial penalties for noncompliance (Abbasi, 2011). K-Electric is accountable to NEPRA for legal and operational issues including customer complaints and their resolution (Sustainability report, 2009-12).

NEPRA was solely responsible for designing performance indicators for K-Electric and for monitoring the company's progress with respect to these benchmarks. Keeping in line with the post-privatisation strategy announced for K-Electric, NEPRA set up efficiency standards for K-Electric, including targets to reduce the T&D (transmission and distribution losses) losses and increase the generation capacity on a yearly basis over a period of time. While setting up the operational plan for K-Electric, NEPRA stressed that reducing the T&D losses would ensure reduced cost for the company and an increased profit margin. Proper maintenance of the transmission lines, on the other hand, would be the panacea for the commonly prevailing feeder tripping¹ issue that had been causing the unannounced 18-24 hour black-outs (The Express Tribune, 2014). Furthermore, constantly increasing the generation capacity would enable the company to overcome the imbalance between supply and the ever increasing demand for electricity (The News, 2014). It was also emphasised by the regulator that if K-Electric was able to execute the T&D and the generation improvement plans in a timely manner, it would achieve its targeted goal of an uninterrupted power supply in the city (The Express Tribune, 2014). In order to accomplish the said task, it was necessary that NEPRA ensured sound capital investment flows from the private utility for steadily improving the operational processes over the years (NEPRA'S Interim Report, 2010). Additionally, as a protector of consumer rights and interests, NEPRA, in its licensing agreement with K-Electric, explicitly declared that the cost of investment should not be passed on to the consumers of the utility in any case (NEPRA's Interim Report, 2010). Abraaj Capital, at that time, willingly agreed to invest US \$361 million in the company over the next three years as part of the privatisation deal (Abbasi, 2011). This amount included investment for improving the overall operational performance of K-Electric by enhancing the generation capacity and reducing T&D losses. This was being promulgated as the biggest post-privatisation investment plan by the company (Azm, 2012: II).

Besides NEPRA, the involvement of the government in the post-privatisation operations of K-Electric was also apparent, but the government made it clear that its role was restricted to providing extended support to the company until it was able to understand the economic, po-

litical and social context of the country (Raza, 2014). The government stressed that its decision to support the new management was deliberate, keeping in mind the failure of the Al-Jomaih group to operate in an entirely different industrial context (Malik, 2007). The state made it clear that they would pull out of the company once it was stable. The government itself acknowledged the shortage of electricity at K-Electric's own power plants, and thereby signed a 5 year contract with K-Electric to supply an additional 650 MW of electricity on a daily basis from its national grid, namely NTDC (the National Transmission and Dispatch Company) (Raza, 2014). The continued grant of subsidies by the government to the company under the tariff adjustment policy was also announced.

The idea of using an independent regulatory framework was borrowed from Argentina and Chile, where the successful restructuring of the power sector was largely due to independent regulatory authorities (Stern, 2000). Although the idea was to create an independent institution that can work without influence from the government or other institutes of high standing, including economic and political interest groups, the government's involvement with NEPRA in matters of tariffs and pricing has been evident in form of direct involvement by ministers in pricing and licensing decisions (Malik, 2007). The role of NEPRA and various influences on the working of NEPRA are outlined in detail in Chapter 6 of this thesis.

Keeping pace with the IMF's suggestions and the government's intervention, NEPRA has recently approved an increased tariff rate in the cost of electricity. However, the board members of NEPRA were unwilling to increase the energy prices (Lerner et al., 2012) as they feared strong public opposition. However, NEPRA recently approved a 50 to 170% tariff increase (Zafar, 2014), highlighting the government's influence on the regulator. In approving the subsidy cuts and increasing energy prices, both the government and NEPRA neglected the societal problems that arose as a reaction (Ahmadani, 2013). The proposed increased tariff strategy was directly at odds with the societal conditions of Pakistan - a country where the majority of the population is earning as little as 10% of the minimum wage criteria applied in the modern West (Global wage report, 2010-11). Therefore, the increased tariffs do not sit well with the inhabitants of Karachi city (Waqas, 2013).

NEPRA's practices are also being received skeptically by the consumers of K-Electric (Malik, 2007). The consumers complain about being treated differently by the regulator. Al-

though consumers still lodge their complaints against the utility, they are not satisfied with the process of complaint handling... albeit, the guidelines set by NEPRA [at least on paper] ‘allow ‘for a complete grievance redressal mechanism’. However, consumers argue that industrial consumers and their complaints are given preference over domestic consumers (Malik, 2007: p. 05).

4.6 The Concept of Integrated Business Centres at K-Electric

The IMF and World Bank’s recent annual report pointed out that a key shortcoming of the current electricity sector in Pakistan has been its limited ability to collect dues for the energy it supplies. This is due, in part, to the lack of specific real time data on energy flows that results in inadequate compliance with usage restrictions. In their report, the IMF stressed that the government should sign performance strengthening contracts with all power sector companies to tackle losses, raise payment compliance, and improve energy efficiency and service delivery (IMF: country report no 13/287, 2013). In a situation where the IMF and World Bank’s intervention in shaping policies for the power sector was backed up by a loan of \$411.3 million to K- Electric (Rizwi, 2014) from the IFC, NEPRA set out certain performance targets to measure the performance of the company every year accordingly. In response to the above conditions laid out by the IMF, and government’s stress on improving the processes, K-Electric’s management willingly embarked upon a major cultural, structural and technological change in the way the company traditionally operated, and shifted to the SAP system technology of controlling activities, measuring the performance of its various departments, and focusing on their customers through the concept/idea of ‘integrated business centres (IBCs)’.

The concept of IBCs is not new to the organisational studies literature. The idea of integrating businesses was initially adopted by American companies, after the American civil war, to address changes in the national economy (Chandler, 1959). The idea of business integration has seen many modifications over the years, where on one hand the large multi-national companies started to decentralise their business structures by establishing separate business units or centres, while on the other hand it has largely been used as a component to centralise the activities of all their business units (Larson et al., 2012). More recently, the use of technology to integrate business units and their underlying operations and processes has increasingly become the centre of focus in organisations, thus leading to its popularity around the globe. The

idea of integrated business centres focuses on helping the businesses align their strategic, financial and operational goals through the use of technology to improve its existing processes (Business integration, 2012). In a contemporary business environment, where there is a lot of uncertainty, organisations are tempted by any new idea (Collins, 2001) that not only promises an efficient way of conducting business but, if successful, can also prove to be a source of prestige and honour for the managers (Grint, 1997). Consequently, the companies also started using technological models to align their business aspects/functions in pursuit of achieving targeted goals, financial benefits, out-manoeuvring competition, and to remain aware of customers' ever changing needs (Jeruchimowitz, 2013; Baldor & Delawalla, 2013). Since the IBC model had been introduced, tried and tested by the developed economies for quite some time (Baldor & Delawalla, 2013), its selection by the K- Electric company was made to reflect the organisation's desire for efficiency and improvement with little regard to its suitability with the societal context within which the company operated.

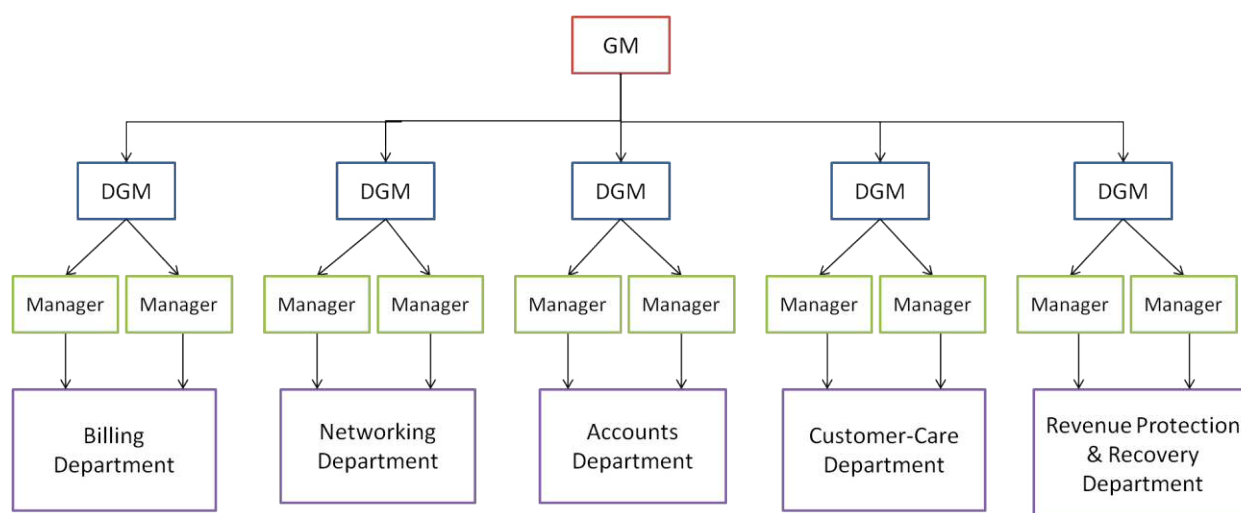
Following the Western blueprint, K- Electric underwent major changes, both in its structure and processes. As stated in the company's newsletter, 'the concept of IBCs was put to practice to test how well it supported the organisational need for innovation and change of processes' (Azm, 2009: II p. 32). The central tenet of K- Electric's transformation and opening up of IBCs was the thorough modernisation of its operations and working norms. K-Electric narrated the change convincingly by stating that the transformation will ensure sustainable economic and financial growth in the ailing energy sector of Karachi (Business recorder, 2013). Whereas, the management defended the idea of opening IBCs on various grounds, including recognition of the fact that the company has been focusing, for years, more on the generation of power while giving less importance to its distribution (core business) side. K-Electric narrated the change wrapped in rhetoric, presenting it as a unique/innovative transformation based on a value creation model that was customer centric in its very nature. The company's management claimed that they wanted to focus extensively on its 2.3 billion consumers (Azm, 2013) through the implementation of IBCs concept. The company attempted this modernisation in two phases: structural and technological. The structural change included the opening of IBCs and the transformation of its culture, working environment, and corporate norms rooted deeply within the company. On the other hand, technological transformation was supported by the implementation of SAP software to improve the administrative side of the business. In what follows, a detailed discussion of the structural and technological change within K-Electric is presented.

4.6.1 Structural Transformation Within IBCs

Separation of the distribution function from other departments of the company, and the opening of 28 IBCs at various locations to focus only on the distribution side of the business was a major structural change in the history of the company (Azm, 2013). IBCs were part of the value creation plan to improve efficiency on the retail (distribution) side of the business by focusing on its customers. This reflected the company's move to reposition itself as consumer focused. According to the top management, 'the milestone step towards building a customer centric organisation was the development of IBCs, which provided a 'one-window solution' to the consumers for launching complaints, providing feedback and initiating inquiries (Shaikh, 2014: na). The idea of opening IBCs was first tested by running a pilot study, where K-Electric opened up an IBC at one of the prime locations in Karachi - Defence Housing Society (KESC, 2013). Afterwards, 8 more IBCs were opened at various locations in the city. A total number of 28 IBC offices are now operating in the city of Karachi (Rizwi, 2014).

The implementation of the idea of focusing on distribution function and opening IBCs came with a huge price tag of \$140 million invested in new infrastructure, including IBC offices (K-Electric, 2014). The structure of all the newly built IBCs was designed to facilitate technology (Azm, 2009: II), which eventually came at greater cost. The Abraaj group introduced a whole new method of working in the IBCs, a 'performance driven culture' as the chairman Gauhar refers to it (Sustainability report, 2009-12). These new IBC divisions were designed to provide all consumer related facilities under one roof. This involved bringing together different departments of K- Electric that previously worked separately. For instance, each of the newly developed IBC buildings had integrated finance, accounts, billing, recovery, networking and customer care sections under one roof (K-Electric, 2013). This was followed by the appointment of different heads looking after various sections in an IBC, and a central head that above all was responsible for the working of the entire IBC. This resulted in a complex hierarchy that suffered from too many levels of reporting, as shown in figure 4.3.

Figure 4.3: Reporting Structure of IBC Divisions



Source: Interview Data

The employees that are now a part of the IBC teams embraced the biggest cultural change management program that the company has ever undertaken (Sustainability report, 2009-12). This cultural change required the employees to learn everything from scratch. Firstly, the employees had to overcome the environmental change, as the employees that are now working in IBCs were selected on the basis of recommendations made by their respective departments, and put to work in an IBC environment that was totally different from the one they used to work in. Secondly, the IBCs focused largely on changing the institutional norms (prevailing for years) regarding how the employees worked and communicated with each other, or how the employees interacted with their consumers to ensure continuous improvement of revised processes (Azm, 2013: II). This new set of practices made the company almost paperless, where the employees were required to use SAP systems to perform various routine tasks. The use of electronic communication was introduced, and it was mandatory for the staff to communicate through e-mails, a system that is well developed/ institutionalised in the Western corporate culture, but rarely seen in Pakistani companies. All the managerial level staff, along with the higher authorities, were provided with advanced mobile sets equipped with

internet facilities so that the employees could maintain communication at all times. To facilitate the electronic communication, the IBC buildings were fitted with fibre-optic internet (Azm, 2013: D). The company even paid the bills for these mobiles from their own budget. The company has also increased their presence on social networking sites, such as Facebook and Twitter, as part of the consumer facilitation framework (Shaikh, 2014).

K- Electric claims that its \$1 billion investment in the utility includes improvement of the dated call-centre as part of their ‘consumer focus’ plan. The company, that still has only one call-centre to serve its 2.3 billion customers (Azm, 2013), claims that 70% additional staff is hired against a total number of 340 employees previously working in the call-centre. According to the company website, these employees are trained extensively to focus on customer relationship management (KESC, 2013) a new practice adopted by the company. K-Electric proclaims that such a move has strengthened its relationship with consumers and helped the company solve customer queries and complaints within the minimal complaint handling time (EMPEA, 2011). The company believes such transformation will facilitate improved customer care by ensuring that the company staff are quick and efficient in their response (KESC, 2013). However, opponents argue that this is another publicity stunt intended to reverse the dying reputation of the company, as the number of public complaints over non resolution of their problems is increasing (Waqas, 2013).

The employees working in the IBCs are given several long training sessions from the in-house staff of the training department. Given the magnitude of cultural change adopted by the company, the training sessions are held frequently, almost every week, where employees have to cope with the twofold pressure of work and training. As stated in the company’s sustainability report (2009-12: p. 75) An extensive training module was developed to train the employees in the workplace. At present, a total of 26 training programs for both business routines and associated technological systems have been designed in-house. the HRM department has been conducting ‘both formal and informal training sessions across all IBCs. Since 2009, 35,390 employees have received 100% in-house training, with 17,315 employees being trained over the last year alone’. The employees were also given manuals regarding the working of every single application of the SAP system they had to use in routine (Azm, 2013). Although the company claims a 100% success rate for this training, with employees happy and willing to accept these changes, many believe that the workers accept these changes and are

seemingly happy with the extensive training sessions only because they have no job security and fear they will be fired at once if they oppose the changes (Chandio, 2013).

4.6.2 Technological Transformation of IBC

The IBCs at K- Electric were apparently initiated to improvise and revise the earlier existing processes and policies through the implementation of new technology. To serve the purpose, the entire foundation of IBCs was set up on the implementation of the SAP (System Application Product) system technology. This technological upheaval was being used to exhibit the company's commitment to its consumers (Shaikh, 2014). Contrary to the above claims, we shall discuss in this section how the company, through the implementation of SAP technology, has focused entirely on its internal core business issues (profitability and cost recovery) while neglecting the system's non-responsiveness to the issues of non-rectifiable bills, more precise identification of non-payers, and customer satisfaction. A detailed discussion of the SAP system, the working of its various components and its utility is presented in the next chapter, hence here only brief account of SAP is presented to develop a general understanding.

SAP is a German software program that has not previously been used in any Pakistani utility, or, to be more precise, the whole Asian region. The SAP system is designed to provide industry solutions to utilities companies that aim to align their business operations. According to the company claims, SAP was an international standard system mainly designed to manage business operations and customer relations (sustainability report, 2009-12: p. 20). Another reason for the implementation of SAP is its compatibility with the 'smart grid system' software that the company was planning to implement in the near future. The smart grid system would allow improved visibility of the energy monitoring process and minimise response time for remote disconnections. The smart grid system at present is in its pilot testing phase. Although SAP was first introduced in the company in the year 2009, not all of its functionalities/applications were explored at that time due to a lack of the technical expertise required to use the technology fully. A number of training sessions were arranged for the employees of the company training department, where specialist IT consultants instructed the staff in using the software. Afterwards, the training department held 64 training sessions for 310 members of IBC staff. SAP was launched in the IBCs in January 2013 by shifting the entire database of consumer data to the SAP system (Azm, 2013: I).

According to the company, a new technology was needed to help prevent fraud occurring at the customer's end, to minimise the energy losses and to improve the overall working of the company. With the passage of time, K-Electric has aligned many of its core operations by shifting them to SAP. Contrary to the company claims of focusing on customer relations, the SAP software has been used to perform varied tasks, including tracking master data required by the various departments to analyse whole company data. The SAP system served the purpose of facilitating the timely recovery of utility bills through its improved data mining systems and meter reading methods (KESC, 2013). The SAP software helped in modernising the data entry systems and activating the energy management systems in order to prevent fraudulent activities. SAP also facilitated an E- billing (electronic billing service) service to check and pay electricity bills online, and to print your bill in case you lost it (K-Electric, 2013). SAP also facilitated the introduction of mobile services to keep customers informed about tariff charges. It also helped the utility in measuring the performance of its 28 IBC divisions (K-Electric, 2013) through its centralised database system by comparing the data generated by all IBCs. SAP also enabled the company to introduce an inventory management system and helped in making online lists of its material stock. This not only led to the accurate representation of the stock available in the store, but also gave employees access to all 28 IBCs to order required material/items online. The adoption of SAP solutions by the human resources department facilitated the generation of a unique employee number for each member of staff, assisted in managing the payroll of all the employees, and helped in hiring and recruiting new staff through its automated initial screening (Azm, 2009: I). The company kept promoting the discourse that the implementation of the SAP system has significantly helped the company to improve its business operations, increase recovery from consumers, increase interaction with end users (customers) of the utility, and monitor the performance of employees while serving the customers.

4.7 Western Influence on K-Electric

Being the sole provider of electricity to the biggest city of Pakistan, K-Electric is facing Western influence exercised not only by the IMF, World Bank and IFC, but also by its newly appointed top management. The Western influence has not only resulted in the privatisation of K-Electric, but also in a shift in K-Electric's business model towards the adoption of the concept of IBCs. An entirely different working mechanism and the implementation of the SAP system within the IBCs was in part due to the management's desire to earn quick profit.

The cultural and technological change within the IBCs was further supported by K-Electric's top management that had Western business values ingrained in them due to their Western education and job experiences. After taking charge of K-Electric, a team consisting of 13 people from Abraaj Capital was selected and sent to Pakistan to run the company (Lerner et al., 2012). This team of key professionals was headed by Tabish Gauhar (Chairman: K-Electric). Tirmizi, (2012: na) defines this takeover of K-Electric's operations as a group of foreigners, unaware of the societal problems of Pakistan, who put forward a 'hard-nosed' authoritarian model of management alien to Pakistani utilities, and implemented it in the company. The founder and leading man of the Abraaj Capital investment group, Mr. Naqvi, has a Western business-like approach deeply rooted inside him. Naqvi studied at the London School of Economics and afterwards worked at Arthur Andersen and co's London office (Lerner et al., 2012), which explains his Western mind set and strong Western consultancy links. The Chairman of K-Electric, Tabish Gauhar, also studied at Kings College London, and has experience of running his own consultancy before joining Abraaj Capital (Hasan, 2014: I). Mr. Gauhar has also written a few articles including one titled 'Why is Pakistan so Ungovernable?' in a book compiled by K-Electric to applaud the utility's decisions and activities. The article praises Gauhar's post-privatisation strategies over and over again. Having a consultancy background has helped Gauhar to successfully portray himself as a guru/hero who has achieved seemingly impossible profit for K-Electric. His heroism and tales of impeccable management have been widely praised internationally as well. Gauhar has visited many international institutes and delivered lectures on how he has rescued a company from total disaster and transformed it into a profitable venture (Husain, 2014). Many international business schools (including Harvard Business School) have also published case studies on the magical turnaround of a classic loss making entity. This case study is, at present, being taught to business graduates internationally as an example of how to govern and positively change the fate of a business entity. Another case study on the same topic is being prepared by the London Business School (source: an interview).

After the resale of K-Electric in 2008, the company arranged various training sessions and workshops in collaboration with the ICAEW (Institute of Chartered Accountants England and Wales) (Azm, 2013: II). The ICAEW arranges workshops to teach methods of conducting business to the company staff. More recently the ICAEW arranged a two day workshop titled 'Business Games', supposedly to create awareness and better understanding of the business

methods, including decision making and assessing the business outcomes (Azm, 2013: II). These activities result in a direct flow of Western business models/ideas into non-Western organisations, where these ideas are presented as superior business models that should be followed by entities in order to be successful. As we shall discuss in the next section, K-Electric's management, despite claiming a profit, has failed to contextualise their Western business model and management style in the social settings of Pakistan. Despite all this, the case of K-Electric being promoted by renowned international institutes of high standing shows the support of the international academic and business community for K-Electric's top management and their business strategy (Business recorder, 2013).

The Western influence on K- Electric's operations can also be observed in the course of the adoption of corporate social responsibility programs and increased focus on environmentally friendly methods of power generation (KESC, 2013). The level of the World Bank's involvement with the K-Electric project can be measured by the fact that even in generating power, the company follows the World Bank's strict guidelines right from the construction phase... to controlling environmental pollution' (Sustainability report, 2009-12: p. 25). K-Electric's compliance with the policies of the World Bank is understandable given the involvement of the IFC in K-Electric's project. The IFC, through the provision of the loan and its stake in the company, requires complete compliance with IFC performance measures on social and environmental sustainability standards. The IFC team has visited twice to monitor the progress of the company in achieving the environmental targets set by the IFC (AZM, 2012: I). The IFC has also been providing advisory services to the company and encourages adoption of Western business models such as community engagement by the private utility (Azm, 2012: I).

K-Electric, as part of the communication engagement plan, has started 'open kutcheries' [open discussion forms]. The idea behind arranging these discussions, as claimed by the company, is to interact with customers directly to get feedback and discuss their grievances (EMPEA, 2011). As per newspaper reporting, most of the complaints raised by the customers in these kutcheries were regarding wrong billing issues (Aman, 2010: translated by the author). The idea behind the arrangement of these open discussion forms was that K-Electric would utilise the feedback of its consumers in reshaping policy frameworks according to customer preference (see KESC complaints and reviews, 2014).

4.8 Self-Claimed Success

The news of K-Electric making a profit after 17 years in 2011-12 and 2012-13 has been largely publicised (see sustainability report, 2009-12). K-Electric's management has been very vocal about the milestone (as they call it) achievement of adding an extra 1010 Mega Watts (MW) of generation capacity, enhancing the transmission & distribution capabilities, and renewing the focus on customer services (Husain, 2014). According to the new management, for years the company had been neglecting the need for increased energy production, engendering a considerable gap between the demand and supply of power. As reported by K-Electric's (2013) website 'more than \$1 billion was invested in KESC, to increase the production capacity'. However, opponents argue that the highly praised program of installing new power generating plants to increase electricity generation was in progress long before Abraaj Capital bought the utility (Husain, 2014). Husain (2014: na) in his article probes that K-Electric's management claims to have earned profit for the first time in 17 years. What we are not told here is how much of this profit is earned through the continuous increase in tariff rates implemented by K-Electric 'under orders issued by the IMF and NEPRA since 2008'. Additionally, what is the percentage of contribution of ghost billing [a concept discussed in the later section] in the cashflows of the company. Moreover, what evidence does the company have to support its claims of a remarkable reduction in blackout hours since 2008? Husain argues, that we should first ascertain these facts and then ask: is it sustainable?'

Being a foreign investor, Abraaj Capital, as part of their investment strategy, replaced some of the conventional methods of doing business in Pakistan. This involved the implementation of SAP system technology that, according to the company, helped them in identifying losses with more precision. However, the company was not able to collect payment in many areas with a stronghold of local groups (Hasan, 2014: II). Given its inability to collect the payment, the company followed the business model adopted by India, where the private utility providers enlist the help of the politicians (individuals with power) to recover their payments (Hasan, 2014: II). K-Electric contacted influential people living within the troubled areas and signed recovery contracts with them. According to the contract, these powerful people, known as 'franchisees', would work for an agreed upon profit with an 80:20 ratio and recover bills from locals in the area on the company's behalf. While this helped the company to recover its costs from these low recovery areas, this practice increased mistrust from within local citizen groups, as they were forced into paying bills by people that, seemingly, had no authority to do so.

Due to the ever increasing pressure of the IMF on the government to minimise the subsidies given to the energy sector, the private utilities are focusing more on the recovery of bills to make profit. The management of K-Electric, on various occasions, has raised their concern that the reduced governmental support and engagement with the utility is posing challenges ‘that are yet to be tackled’ (Shaikh, 2014: na). Chairman Gauhar was also quoted saying “the government is decreasing the subsidy given to the utility due to pressure from international monetary institutes” (Ummat, 2010: na, translated by the author). As a result, individual power supplying companies that are unable to recover their production cost are compromising on the work ethics as outlined by the judicial system of the country. There have been many instances where even the top management of K-Electric have been found guilty of misusing their authority by making profit through ghost billing- a term given to unjustifiable bills and unlawful hidden charges.

4.9 The Societal Context Surrounding K-Electric

K-Electric is a major electricity generation, transmission and distribution company that has been serving, for almost a century, the biggest city of Pakistan and providing a good example of a least changed entity, as it is one of the very few entities around the world, and the only one in Pakistan, that remains vertically integrated (K- Electric, 2013). Although being a monopoly supplier of electricity to the biggest city of Pakistan is an advantage/opportunity in itself, it comes with the challenge of navigating through the difficult social and political environment within which the company is based. For many years the biggest challenge for K-Electric has been to operate within an unstable environment. Karachi city has no proper leadership, as Karachi’s dominant political party has always been in direct or indirect opposition to the government, despite sometimes being part of the government. This clash of power has left many issues of utmost importance being neglected (Hasan, 2014). The prospects of development in the energy sector have been impeded by both internal and external factors. The internal factors include self-generated energy losses from the system due to inadequate maintenance leading to power break downs, insufficient power supply, unannounced blackouts, ‘pervasive corruption (by the staff) and the lack of a uniform ethical operational framework governing the organisation’ (Shaikh, 2014: na). While external factors included problems of the unwillingness attitude of national institutes to make timely payments to the utility and illegal means of power usage by the consumers that did not allow the company to earn profit for 17 years (Lerner et al., 2012: p. 01).

The internal problem of energy losses has also been contributed to by a lack of significant development or investment in poor infrastructure. Poor cable connections and low quality wirings and switching throughout the city have always been a major cause of line losses self-generated by the system (Husain, 2014). These losses result in safety hazards faced by the line staff and an overall loss to the company. The company, rather than solving the issue, used long blackouts known as ‘load shedding²’ to cover their own losses. The practice of blackouts instead of solving the problem of line losses made it apparent that K-Electric had neglected internal problems and thus damaged the company’s image and reputation among the citizens of Karachi. These blackouts have proved to be more of a problem than a solution. The unstable power supply has forced many industries to move to neighbouring Bangladesh (Lerner et al., 2012).

The losses are further aggravated by corruption at the lowest level, where the line staff responsible for taking meter readings take bribes from house-holds and settle on a reduced meter reading entry in their records. In Lerner et al.’s (2012) case study they have presented the chairman as almost a super hero who has done the unthinkable, they mention the issue of recording meter readings inaccurately and lack of staff expertise as a thing of the past. On the contrary, even recent articles point out the inadequate infrastructure (as claimed by K-Electric’s officials themselves) for recording meter readings with precision (Shaikh, 2014), due to which customers in Karachi are issued bills using average recordings. As a result the electricity bills are much higher, even in the off-peak season when electricity consumption is minimal. K-Electric is largely criticised by the citizenry on account of this inefficient, unethical and non-professional conduct. Every year thousands of complaints are registered for wrong billing. K-Electric’s online complaints board is filled with many such complaints (KESC complaints and reviews: wrong billing, 2014). This has resulted in K-Electric’s policies being questioned by their consumers. When probed about the post-privatisation changes, one customer stated:

“We usually do not trust the government, so when we heard K-Electric was privatised we actually thought great things would happen, because privatisation is often associated with more transparency, efficiency, improvements etc. But over the years, our excitement was overtaken by frustration, as K-Electric officials proved to be more corrupt, where none of our problems have actually been resolved ” (Interview, 25th February, 2015).

K-Electric chose to address the external problems faced by the company on a priority basis, as solving these could generate positive cash flow. As a result, the company adopted a massive structural change strategy. The company opened up 28 IBCs and implemented the SAP system technology supposedly to improve and instil efficiency in the system. However, in reality these changes mainly focused on recovering/reducing the \$197 million loss incurred since acquiring the company (Reuters, 2014), rather than addressing issues of corruption, negligence and unethical corporate behaviour on the part of the company itself. This is evident from the fact that even after the implementation of SAP within the IBCs, the company has constantly been accused of wrong billing, having no proper system of rectifying bills once issued, blacking out the city for long hours, not responding to customer complaints, and taking bribes. Although a few system errors that are discussed in detail in this section contributed equally to the inefficiency of the company, the recently adopted technologically equipped business model - SAP - did little (except modernizing) to improve the processes where system errors were identified leading to increased societal problems and dissatisfied locals.

After acquiring the company, the first step Abraaj Capital took was the laying off of a large number of the company's staff. 'The management decided to outsource non-core operations like power-line repair work' and caused 7,000 workers to be unemployed by offering them monetary compensation - 'golden handshake (Hasan, 2014: I, na). Many other employees were fired from their job without any compensation. The management believed the company had recruited more workers than were actually required. This situation increased unemployment and thousands of families lost their income, and aggravated the conflict between the management and labour unions. Those that lost their jobs went on strike, and a few angry workers even set K-Electric's offices on fire. This situation instilled fears of job insecurity among those still in a job (Chandio, 2013).

There are several areas (mainly low income neighbourhoods) in Karachi where the inhabitants have started practicing electricity theft after being disappointed with K-Electric's policies. Over time, these community groups have evolved into a 'criminal mafia culture' that sees them take law and order into their own hands. Hasan (2014: na) refers to the situation in stating that the employees of K-Electric are well informed about not messing with the local groups in the (Al-Karam Square) Liaquatabad area. 'Hundreds of apartments are cramped in

a cluster of buildings. If a fight breaks out, there is a ready force of 20-plus men to defend their turf'. In these areas people have long been involved in using electricity through illegal means without paying for it. The culture of putting in illegal connections, referred to as 'kunda-culture', is tacitly approved by the political parties and is a common practice in Karachi (Lerner et al., 2012). When K- Electric was privatised, it made repeated attempts to control the situation without success. Fahad Ali Khan, the GM of marketing and communications, stated that the company initiated an extensive 'kunda-removal' campaign which removed 250,000 illegal wired connections from nearby transformers. However, almost all of the wires were reconnected to the transformers within a day (Shaikh, 2014: na). The inhabitants of these areas perceive their act of 'power theft' to be justified by arguing why they should pay when the company issues wrong bills for a huge payment amount that they simply cannot afford. They believe their bills do not reflect the actual amount of electricity they consume. With 12 to 15 hour blackouts, the authenticity/credibility of the issued bills is questionable. As a result, when the detection teams are sent to these areas to inspect those involved in electricity theft and to disconnect illegal connections, they get beaten up by the community. The company staff's insistence on cutting off the connections has often resulted in K-Electric's offices being set on fire (Hasan, 2014: II).

This situation has led to a never ending conflict in which K- Electric blames consumers for recurring losses that the company has not been able to minimise. On the other hand, the consumers claim that K-Electric's own staff are responsible for making these defaulters even more powerful by accepting bribes from them and not taking any legal action against these community groups. These accusations are directly at odds with the new management's claim that they have a 'zero tolerance policy' for acts of bribery and have terminated staff that were involved in corruption (Lerner et al., 2012). However, the following example renders visible the involvement of K-Electric's line staff in 'power theft'. A customer (Khalid Ahmed) complained about this situation during the interview:

“When on earth will they arrest those people who are using electricity illegally with the help of K-Electric's staff? We report illegal connections to the IBCs concerned, but the staff comes here, takes bribes from the people, and does not take any action against them. And before leaving, the staff informs these powerful people who the complainer was.” (Interview, 13th March, 2014).

There are also customers who want a permanent solution to the power theft. A consumer (Hameed Pathan) on the Facebook page reported:

“Kindly do something about the power thieves, I got bill amounting to 5,799 and same capacity of my lot of neighbors get below 2000 LOL because I am an honest consumer” (6th July, 2014, grammar corrected by the author).

4.9.1 Unequal Treatment of The Society

One of K-Electric’s new working policies has been to divide the whole city of Karachi into 9-10 sub-divisions. The company claims that such divisions allow them to classify areas according to the recovery of bills from each (Azm, 2013). As per company claims, the areas from where recovery is satisfactory are exempted from blackouts, and the areas with low recovery face heavy blackouts every day. The chairman of K-Electric, Tabish Gauhar, during his interviews and lectures delivered at various universities, has named it a ‘carrot and stick policy’ (Hasan, 2014: II), where the company has underlined ‘a correlation between theft and load shedding duration’, and areas with low recovery observe long hours of blackout as punishment (Sustainability report, 2009-12). The policy has been applauded by international academics (see for example Lerner et al., 2012), however, this collective reward and punishment policy ignores the fact that there are many regular bill payers in the low recovery areas and regular fraudulent customers, non-payers in high recovery areas. In such a scenario, the company’s inefficiency at identifying individual non payers not only prove the failure of its recently implemented SAP system to identify non-payment more accurately and precisely, but also violates basic human rights. A customer (Moazzam Ali) complained about the situation:

“You should try to detect illegal connections individually and do your work sincerely. Please provide energy at least to those that pay their bills in full” (Facebook, 8th January, 2014: translated by the author).

This was the response of K-Electric’s Facebook page administration to the above customer’s complaint:

“Areas face LS (load shedding referred to as blackouts) not because of shortfall [of energy supply], but as per the ratio of theft and defaulters in an area. If theft goes down, so will the LS hours” (8th January, 2014).

On the other hand it was noted that the company’s division of Karachi city into different areas was done keeping in mind the class system rather than on the basis of recovery (Express Tribune, 2014). It was evident that the division was carried out to separate the wealthier areas, middle income areas, and poor neighborhoods. The wealthier areas that were occupied by the elites of society remained exempt from the blackouts, mostly. Whereas, severe blackouts are observed in the poor and middle income areas of the city (Haider, 2015). The chairman of the company had himself admitted that “I have been labeled anti-labor, capitalist and someone who cuts the electricity supply of poor areas to favour elite neighborhoods” (as quoted in Hasan, 2014: II, na). During interview sessions one of the general managers of the IBCs, while talking about the success of K-Electric, informed the researcher:

“The areas of Clifton and Defence (wealthiest areas of the city) are now completely free of blackouts” (Interview, 15th January, 2015).

While interviewing the IBC Johar (area occupied by middle level income people) staff, a manager informed the researcher that for the past two years their IBC office has won the award for best performance and highest recovery among all IBCs (Interview, 6th January 2014). When the researcher asked customers residing in the Johar area, the informants revealed that they were observing 6-8 hours of blackouts in off peak season, and 10-12 hours of blackouts in the peak season. The hours of blackouts increased if any fault occurred in the system.

Although K- Electric claims that poor areas are being punished due to non-payment of the electricity consumed, there are many such examples where people from wealthier areas and even the governmental departments (including police department, Karachi Water and Sewerage Board: KWSB) are involved in non-payment of electricity bills (Express Tribune, 2014). In another instance, Gauhar admitted that “if the government had paid its bills, we would have made a small net profit last quarter” (as quoted in Lerner et al., 2012: p. 03). In another statement (Hasan, 2014: I, na) Gauhar said: “various influential governmental organisations

are involved in non-payment of huge electricity bills costing billions of Pakistani rupees, and to recover the money from these institutes' remains a big challenge in itself'. Whereas, Khan GM marketing communications department stated that "certain factors are beyond our control. The government and especially the KWSB have yet to pay its dues" (as quoted in Shaikh, 2014, na).

Although K-Electric officials claim that they are working on taking payment from these powerful institutions, if there is no punishment for the powerful institutions why do the poor areas suffer from long blackouts, and where does the concept of equality and justified treatment stand in such a situation? The inhabitants of the poor areas have suffered from blackouts as severe as 12 to 15 hours long, leaving the populace enraged over the company's policies (Lerner et al., 2012). K- Electric's official Facebook page is filled with customer complaints, A few comments from the page read:

"Black outs are now the only answer to your inefficiency" (Batul Hasan, 7th May, 2014).

Another consumer (Saima Theebo) mentioned:

"Even if the day becomes 12 hours long instead of 24, K-Electric will still do 12 hours of load shedding" (14th March, 2014).

4.10 Conclusion

This chapter sheds light on the importance of the wider socio-economic context on the workings of K-Electric. It describes in detail how the macro environment has partly shaped K-Electric's new policies and how these policies have affected society. In doing so this chapter highlights the activity of macro-economic players The IMF and World Bank in the emerging economy of Pakistan. It is observed that these macro-economic players can have considerable impact on both state and organisational changes adopted (either forcefully or willingly) by these institutes. In this regard, the major change program embarked upon by K-Electric (in the post-privatisation period) involving structural and technological amendments, had two-fold implications. Firstly, the newly appointed management wanted to come up with an innovative strategic plan that can apparently reassure the macro-economic players that their suggestions and recommendations were seriously taken into consideration. Secondly, to put in

place a structural and technological reform that can work in its own right and fulfill long term goals. The chapter concludes that the benefits of changing the traditional working norms of the company and using technology to support its operations are both exaggerated and self-proclaimed. Whereas, the company's efforts to depict the institutionalisation of both cultural and technological change as a success story are simplistic, as they lack wider acceptance by society.

Lastly, it can be argued that K-Electric faced a 'difficult to operate' socio-economic context in Pakistan, and faced challenges from governmental institutions and a few societal groups. However, K-Electric was also engaged in non-ethical practices that created a mistrust in public about the utility. The company's response to the overall societal issues was an inappropriate strategy that created a huge gap between the problem and the proposed solution put forward by the Abraaj Capital.

Chapter 5: Implementation of SAP Technology in K-Electric and its Effects on Society

5.1 Introduction

At a November 2009 ceremony, K-Electric's officials announced the signing of a deal with a global consultancy firm, Abacus, for consultation regarding the shifting of the existing core business operations of the company to System Application and Product- Industrial Solutions for Utilities (SAP-ISU) (Abacus Consulting, 2014; The Nation, 2009). At the ceremony, K-Electric's management claimed that the implementation of the new SAP technology would provide solution to the three-fold problem of irregular electricity supply, poor development of the infrastructure, and the non-payment of bills by the consumers (The Express Tribune, 2014). This ambitious and strategic plan required the injection of new capital to implement SAP technology, enhancement of generation capacity, reduction of transmission and line losses, and complete organisational restructuring (Azm, 2009: II). The top management was convinced that the technological upheaval and the implementation of SAP model would bring positive results. During interviews, K-Electric's IT department staff stressed that SAP was not only advanced in terms of functionality, but also best suited for the company's future IT goals. During interviews, the IT department's staff also named many components of the SAP system and explained how they were functionally advanced. It was argued that the SAP system would automate the maintenance of the grid operations, billing process and meter reading, thus allowing greater control and accountability (KESC annual report, 2010).

In this chapter, the implementation of the SAP technology and how it affected the core business operations of K-Electric –generation, transmission distribution and supply– will be discussed in detail. Although this thesis mainly focuses on the retail business of K-Electric's operations, which include the supply and distribution (SD) function and the effects of the company's performance on its end consumers, this chapter will also define the generation and transmission function of the company in order to provide a better understanding of K-Electric's business processes. It is argued that discussion of all the business processes is also necessary because the company's choice to implement the SAP technology involved the up-

grade of all four core business operations including the generation and transmission function. Moreover, it is important to understand the generation side of K-Electric because it provides direct insight into the major problems faced by K-Electric's customers, i.e. the power cuts. In what follows, a historic background of the company's business and the main problems with its operations as identified by the new management will be outlined. In the next section of the chapter, the decision to implement the SAP technology and the claims about its supposed benefits as outlined by the company will be discussed. This will include a discussion of SAP's architectural design and the different modules that were implemented with a view to yield operational benefits. In the last section of the chapter, the post-SAP-implementation scenario and its actual effects on the company's performance and on society will be discussed.

5.2 Business Operations of K-Electric

Like those of any other electricity provider, the routine business processes of K-Electric were based around the electricity supply chain network that started with electricity generation and ended up supplying electricity to the consumers (Iqbal, 2015). K-Electric supplied electricity to industrial, commercial, agricultural and household consumers. The business cycle of K-electric included four main functions: generation, transmission, distribution, and supply (Iqbal, 2015).

When Abraaj Capital took over the company, they stressed that problems were found in all core aspects of the utility, including generation, transmission, distribution, and supply. During media interactions, the company itself admitted that the most crucial and alarming problem faced by K-Electric was associated with the generation function that caused interruption in the provision of electricity to its customers (Hasan, 2014: II). It was also recognised that the generation side of K-Electric's business was underperforming due to the lack of investment in installing additional electricity generating capacity as no significant effort had been made to upgrade the old power supply system (AZM, 2009: II). K-Electric officials also stressed that during the nationalisation period, i.e. under government control, there had been little effort by the company to increase the generation capacity of its plants (Hasan, 2014: II).

The transmission and supply function of K-Electric was in an equally vulnerable position. Poor quality wires, that were used to provide cable connections to the consumers, caused self-generated electricity losses and frequently occurring line faults. The old transformers¹ and

poorly maintained grid stations often got tripped and caused electricity breakdowns. The breakdowns became severe, especially during the monsoon season where a fault in the power supply or grid station took two or three days to be restored (Azm, 2009: I).

In addition to these line losses, power theft occurring at the distribution end was becoming an endemic problem for K-Electric (Haider, 2015). At the consumption side, the customers used illegal connection wires for free electricity. Additionally, K-Electric officials accused many public sector companies as well as powerful individuals of not paying their electricity bills on time (Hasan, 2014: II). At that time, the recurring losses of K-Electric were mainly connected with poor infrastructure, electricity theft and the non-payment of bills. It was also identified that these problems, relating to the core functions of K-Electric, caused a recurring energy crisis that remained unsolved and affected other sectors of the economy as well as various segments of society.

5.3 Why SAP? Selection of SAP by The Management

Soon after its privatisation and the identification of problems with the company's core business functions, K-Electric announced a technological solution supposedly in their quest to entirely revamp the business processes and improve the company's performance (Manross, 2011). As a result, K-Electric's management signed a deal with Abacus Consulting (the largest consulting, technology and outsourcing firm in Pakistan) to implement the SAP-ISU system within K-Electric (The Nation, 2009). The SAP-ISU system is especially designed for utility-providing companies to integrate and automate the functions of generation and transmission alongside their timely upgrade (Abacus Consulting, 2014). During the agreement signing ceremony, held at K-Electric's head office, the then CEO of K-Electric maintained that the implementation of SAP would provide an integrated technology platform that would help in modernising the utility. While delivering the speech, the CEO asserted that SAP was selected after reviewing all the best business technologies available in the world, and that the decision to implement it was made due to the globally proven performance of SAP in the utilities sector, where more than 600 of the world's leading utilities were observed to be working with SAP to run their business processes (The Nation, 2009).

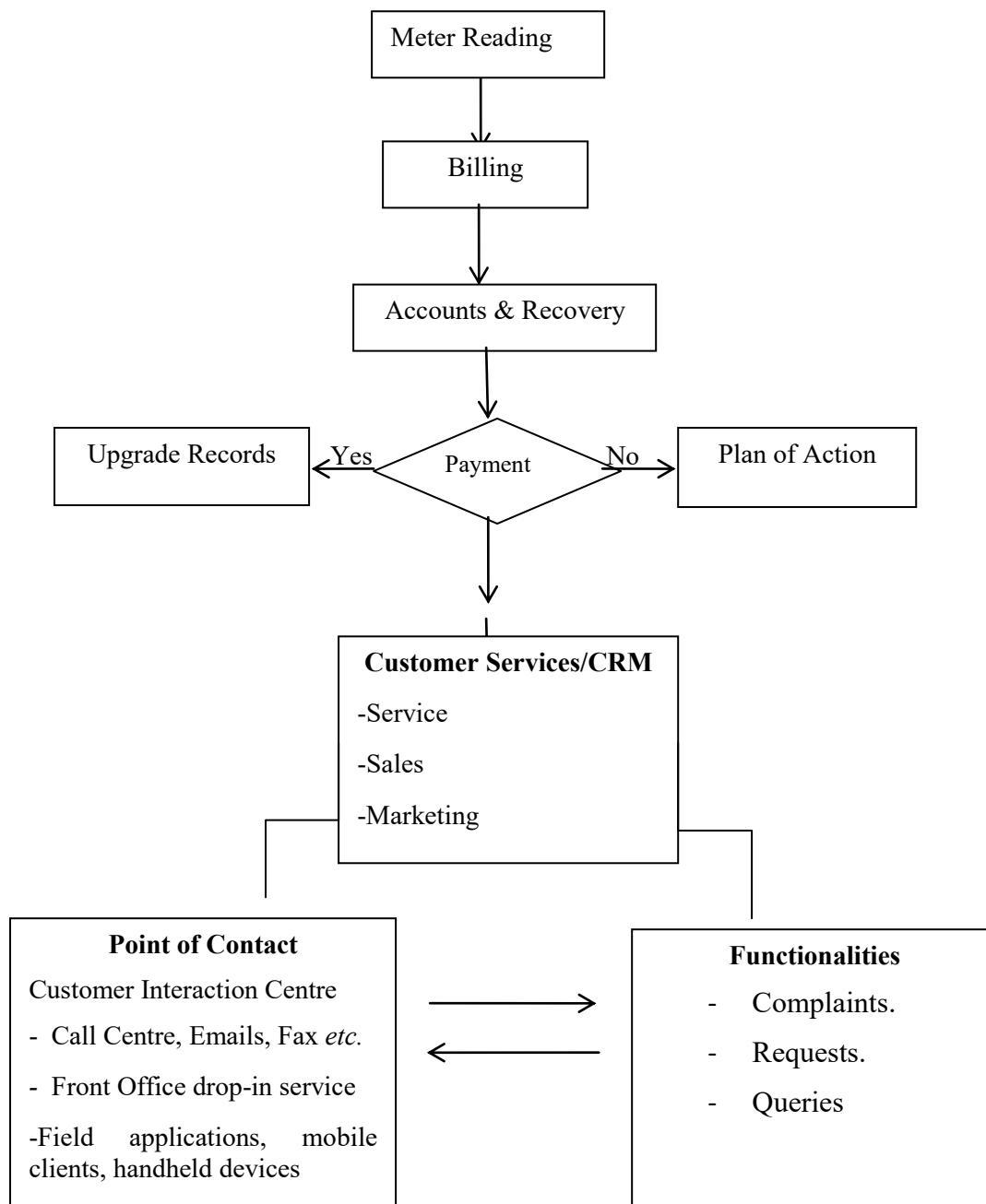
In that speech, SAP was presented as fitting well with the functional requirements of the company along with its alignment with the long term IT strategy as developed by the man-

agement. The implementation of SAP, as claimed by the company, would help in improvising the areas of generation, transmission and distribution alongside capitalising on customer relationship management, a concept new to the company (Iqbal, 2015). Simultaneously, the implementation of the SAP system within K-Electric was being promoted as a technological tool that was being used to entirely rebrand the utility as ‘customer centric’ (K-Electric, 2013). At various media-interaction events, K-Electric officials called it a complete transformation, where customers would be at the centre of K-Electric’s working strategy (Shaikh, 2014). While addressing the same event, the president of Abacus Consulting, Asad Ali Khan, said that the implementation of the SAP technology within K-Electric would help the company in solving the endemic problems it had been facing for years. Thus it was articulated that the SAP technology had the potential to improve generation capacity, maintain the power plants, enhance customer services and financial management, and reduce line losses and company costs through advanced monitoring and evaluation processes. In 2014, Abacus Consulting also expressed that the SAP system would help the company’s employees gain immediate access to real time enterprise data and would enable them to make timely decisions, thereby reducing the risk of electricity breakdown (Manross, 2011).

5.4 The Technological and Infrastructural Restructuring of K-Electric

The implementation of the SAP technology and, as termed by the company, ‘the new customer focused strategy’ meant the complete restructuring of the organisation, followed by a major cultural change within the company (Shaikh, 2014). Using the SAP technology, the company integrated the management of its core business functions of generation, transmission, distribution and supply. The SAP technology was also used by the company to integrate various functions performed at the SD (supply and distribution) side, so that all customer-related services could be provided under one roof, and all departments (e.g. accounting, billing, customer care/complaints handling and recovery) could be located within a single office –IBC. The integration of the SD function and the establishment of the IBCs, covering the entire customer related operations of the area in which they were located, was done with a view to create a single physical point of contact for customers residing in different localities. As per the company’s claims, the integration provided the opportunity for closer monitoring of each function with more chances to improve problems separately so that the processes could yield positive results together. As shown in figure 5.1, SAP enabled K-Electric to integrate and automate its existing SD work processes such as meter reading, billing systems, business intelligence and customer services.

Figure 5.1: Functional Areas of SD (Sales and Distribution) Business Process.



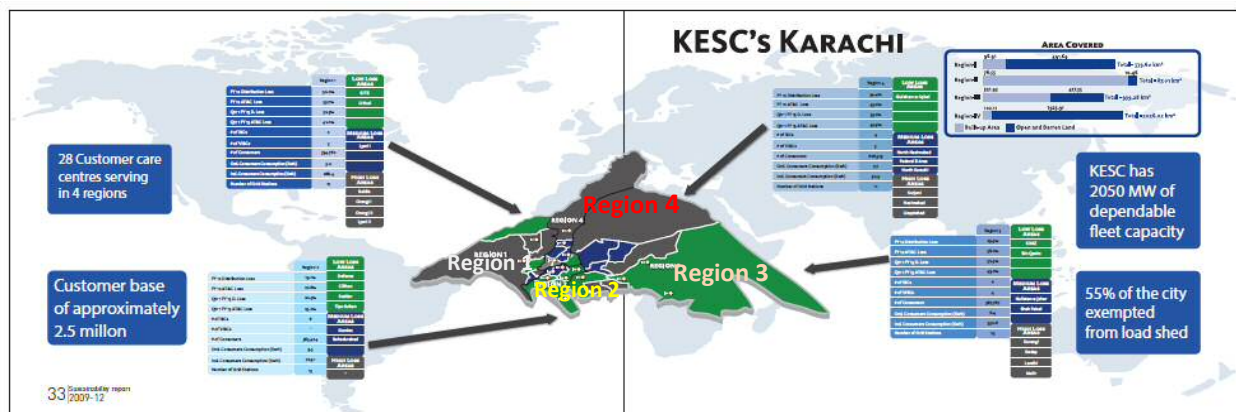
Source: Prepared by author

In order to provide the integrated SD services under one roof, the company had to change its existing infrastructure and create different offices across Karachi (K-Electric, 2013). To serve this purpose, K-Electric required structural changes to its retail (distribution) business. The customers who conventionally used to visit different offices to make complaints, get there bills issued, etc., would now be served at one single location, i.e. 'IBC'. The opening of the

IBC branches was being seen as part of K-Electric’s strategy to resurrect its distribution function. Prior to constructing the IBC buildings, K-Electric virtually mapped the city of Karachi by dividing the whole area covered by K-Electric into four zones. It is argued that in mapping out the zones, the wealthier areas were purposely separated from the middle and low income areas. Following this division, the decision to construct 28 IBC buildings in main locations throughout Karachi was taken. The total cost involved in this restructuring was estimated at \$140 million (Abbasi, 2011).

The division of Karachi into four zones and the proposed IBCs at prime locations are shown in figure 5.2. The IBCs, once established, were supposed to work as autonomous business units responsible for dealing with the distribution function of the area allocated to them. The IBCs were also solely responsible for cost recovery from their allocated/mapped area and to provide customer services by dealing with consumer issues. Under the IBCs, the maintenance, technical and commercial functions will be combined and looked after by a single general manager (Azm, 2009: II). The general manager concerned would be held accountable for the losses, collections, productivity and profitability of his IBC. All IBCs would be organised as self-contained profit centres.

Figure 5.2: Visual Mapping of Karachi City



	Region 1	Low loss areas
FY ₁₂ Distribution loss(DL)	30.2%	SITE
Qtr ₁ FY ₁₃ DL	32.5%	Uthal
Number of IBCs	7	Medium loss areas
Number of consumers	534.762	Lyari I
Number of grid stations	12	High loss area
		Baldia
		Orangi I
		Orangi II
		Lyari II

	Region 2	Low loss areas
FY ₁₂ Distribution loss(DL)	19.1%	Defence
Qtr ₁ FY ₁₃ DL	20.5%	Clifton
Number of IBCs	6	Saddar
Number of consumers	585.424	Tipu Sultan
Number of grid stations	13	Medium loss areas
		Garden
		Bahadurabad
		High loss area

	Region 3	Low loss areas
FY ₁₂ Distribution loss(DL)	29.5%	KIMZ
Qtr ₁ FY ₁₃ DL	32.5%	Bin Qasim
Number of IBCs	8	Medium loss areas
Number of consumers	587.787	Gulistan e Johar
Number of grid stations	25	Shah Faisal
		High loss area
		Korangi
		Gadap
		Landhi
		Malir

	Region 4	Low loss areas
FY ₁₂ Distribution loss(DL)	34.4%	Gulshan e Iqbal
Qtr ₁ FY ₁₃ DL	35.2%	Medium loss areas
Number of IBCs	7	North Nazimabad
Number of consumers	626.319	Federal B Area
Number of grid stations	11	North Karachi
		High loss area
		Surjani
		Nazimabad
		Liaqatabad

Source: Reproduced from Sustainability Report 2009-12: p. 30

5.5 SAP Technology and K-Electric's Long Term IT Planning

Another important point behind the selection of the SAP technology was its compatibility with the long term IT strategy of the company (The Nation, 2009). K-Electric wanted to implement the smart grid system, another technological solution that was believed to address the issue of electricity theft, non payment of bills and more precise identification of line losses. The architectural design of SAP was flexible and allowed complete integration of the smart grid technology with its existing components/modules (Khan, 2014). Although the announcement of the smart grid technology to be used by the company was initially made in 2012, K-Electric finalised the deal with 'Info Tech' in January 2014 to pilot-test the smart grid technology in a few areas and then install it throughout the city. Info Tech, another IT consulting giant of Pakistan, agreed to integrate the smart grid system in the existing SAP technology to achieve automation of the grid operations. At present, the smart grid model is also being rolled out in some other state owned utilities with the help of USAID (The Express Tribune, 2014). As part of the agreement, two main components of the smart grid system are being installed currently: Oracle Utilities Meter Data Management, and Oracle Utilities Network Management System. The implication of the smart grid system would mean complete automation of the entire grid and meter reading systems. Once installed, the network management system will be capable of separately monitoring each activity of the supply chain network. The implementation of this system would give the company access to the real time information needed to ensure reduced losses and significantly help the company in locating energy theft more accurately. The network management tool will also help the staff in managing recoveries, pro-actively addressing network performance issues, enhancing the distribution planning capability, and improving outage management (Khan, 2014).

During the deal signing event the CEO of Info Tech mentioned:

“The automation helps cut losses in the electricity supply chain, ... traditionally it is often difficult for authorities to identify losses at the distribution side because there is no way to pinpoint consumption at different points of the delivery system... Now we have the technology to fix that and we know exactly how much power that has left a feeder has reached a pole mounted transformer (PMT), and how much of that gets to the consumer.” (as seen in Express Tribune, 2014: p. 14)

The second component of the smart grid system, the utilities meter data management system, would hopefully be able to reduce the corruption taking place at the ground level. Adopting

the meter data management system would mean the replacement of the manual meter reading methods with automated processes. This will ensure that a line man cannot record a wrong/reduced meter reading by taking bribes. In order to achieve the automation in meter reading, K-Electric will roll out AMI (Advanced Meter reading Infrastructure) across the city. This project would also be pilot-tested, and initially 10,000 smart meters will be installed in a few selected areas of Karachi, as done previously, during the implementation of SAP in the IBCs. This project is supposed to be a major step forward towards the establishment of the new K-Electric plan (Khan, 2014). While reflecting on the costs involved in this large scale modernisation of the company, the CEO of Info Tech said:

“Automation of the grid would need an investment of between \$200 million to \$300 million annually for a period of at least five years. This is nothing compared to what the city is losing due to the inefficiencies in the system... at least Rs500 billion go missing from the power system every year due to the technical losses and theft. It would be a hard decision, but one which needs to be taken. I think consumers could be charged a certain fee in their monthly bills for a few years to recover this cost” (The Express Tribune, 2014: p. 14).

5.6 Physical Implementation of SAP in K-Electric

The work on constructing the new IBC buildings and equipping them with the SAP system started in December 2009 (Azm, 2009: II). The process of the IBCs’ establishment in various regions and implementation of the SAP system within the IBC buildings took place in phases called ‘Josh’. Firstly, the idea of IBCs and the use of SAP to support IBC operations was pilot-tested in the first phase of the ‘Josh’ program that started off in December 2009, and for the first time, two newly built IBC offices (IBC DHA and IBC North Nazimabad) started using the SAP system in October 2011.

During the first phase, around 320 end users (employees) were trained to work on the SAP technology with help from the IT staff of Abacus Consulting (Azm, 2013). By that time, the business master data of 200,000 customers was transferred to the SAP system. These customers were immediately transferred to the new billing methods. The second phase of the ‘Josh’ program took place between January 2012 and July 2012. This time, a total of 6 IBCs (IBC Clifton, IBC Johar, IBC Gulshan, IBC SIMZ, IBC KIMZ and IBC PSC) were shifted to the

SAP system. During the second roll out phase, the data of a total of 828,750 customers was shifted to SAP. The initial project delivery date was 13 July, 2012 but the team managed to deliver the project 12 hours before the delivery date. However, it took the technical staff about 7 more days to make the system fully functional and available for use to the IBC staff. At this point, another 200 employees were extensively trained to work on the SAP system. During the third phase of the program, from September 2012 to January 2013, 9 other IBCs (including IBC Saddar, IBC Bahadurabad, IBC Federal B area, IBC Liyari, IBC Bin Qasim, IBC Garden, IBC Tipu Sultan, IBC North Karachi, IBC Shah Faisal : Source Azm, 2013) were shifted to the SAP system. After the third implementation phase, the company shifted another 850,000 customers from traditional billing methods to the SAP facilitated billing methods (Azm, 2013). Once again, this was followed by training sessions arranged for 300 employees to enable them to work on SAP's different modules. By the end of the third phase of the 'Josh program', the company was able to shift 70% of its customer data to the SAP meter reading and billing methods. The third phase of the project was delivered two months ahead of the targeted date of 7th February 2013, and this time the system was ready to work on the day the implementation was completed without affecting the billing system of February itself.

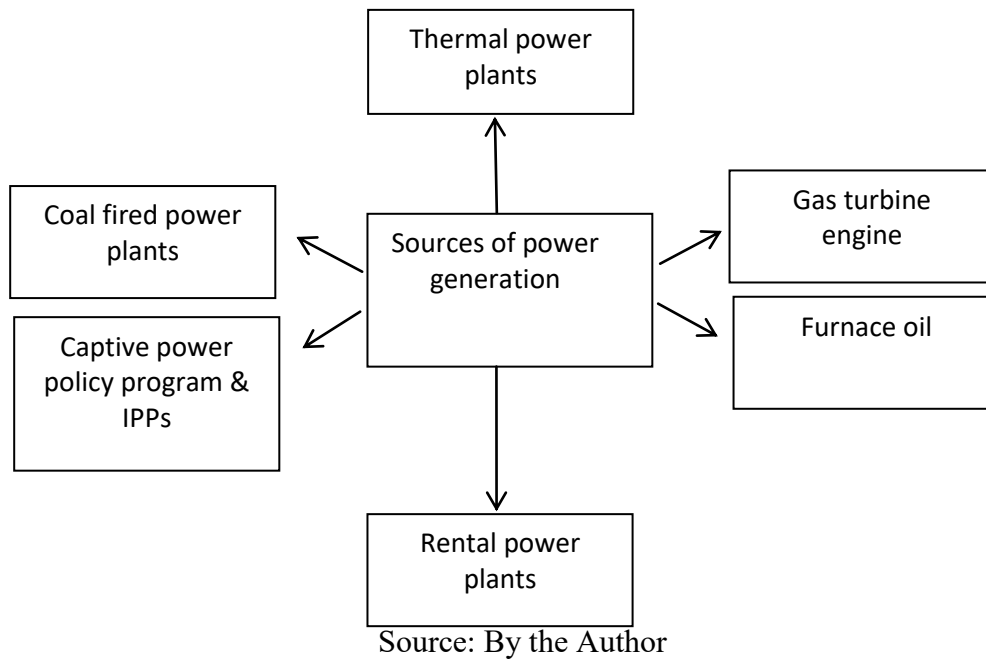
The IT professionals from Abacus, who sold the SAP system to K-Electric, were involved not only in designing and customising different functions of SAP to suit K-Electric's requirements, but also in extending the after-sale services to K-Electric (Abacus Consulting, 2014). As part of the deal, the IT consultants from Abacus worked closely on different components of SAP with the IT department of K-Electric. The implementation support offered by Abacus Consulting involved extensive training sessions arranged by the consultants for K-Electric's IT staff. The training sessions were aimed at teaching different functionalities of SAP so that K-Electric's IT staff could discover the potential uses of the system and work around them easily. Once the staff were sufficiently trained in working with SAP, K-Electric established its own IT SAP department, where the company's IT department staff worked in close collaboration with other business users, especially with the staff that were internally promoted and transferred to the newly opened IBCs (Azm, 2009: II). By that time, the in-house IT staff became responsible for training the IBC employees about the functionalities of the SAP system. By that time, the 'Josh program' had reached its third phase and K-Electric's IT SAP department became trained enough to carry out the installation of the SAP system all by itself, i.e. without any help from Abacus Consulting.

5.7 SAP Supporting the Generation and Transmission Functions.

When Abraaj Capital took control, they put forward in a press meeting the issues faced by the utility at that time. It was highlighted that, being the biggest industrial and commercial city of Pakistan, Karachi attracts a large number of migrants every year who permanently settle in the city (Hasan & Mohib, 2003), which contributes to a 5% yearly average increase in electricity demand. The management told the press representatives that since 1997 no additional generation capacity was added to the grid to fulfil this increasing demand (Azm, 2009: II). Thirteen out of 19 power generating plants of K-Electric were technically obsolete, where the upgrade and maintenance of plants had been almost non-existent (Haider, 2015). Power supply networks were so fragile that even light rain could trip them out.

Following the identification of the key issues within the generation function, K-Electric's management at that time announced the installation of additional power plants as part of their long term strategy to achieve self-reliance in terms of electricity generation (Azm, 2009: II). The management stressed that the long term goal of K-Electric was to overcome the electricity breakdown issue and provide a stable electricity supply to the citizens of Karachi. As part of the proclaimed resurrection strategy to enhance electricity generation, the management announced increased power supply to the grid stations by various means, including the enhancement of K-Electric's own thermal power stations' capacity, installation of new gas plants, purchasing power from IPPs (Individual Power Producers), renting the power plants of different international companies, and the long-term plan to use coal-fired plants to generate cost-effective electricity. It was also expressed that furnace oil would still be the primary source of electricity generation, as the majority of K-Electric's existing power plants had been running on furnace oil (Abbasi, 2011). The generation enhancement strategy, as outlined by K-Electric, is further elaborated in figure 5.3.

Figure 5.3: Strategic Plan To Enhance Electricity Generation.



The company gave further details of the deals signed with some international companies to install power plants that were supposed to increase the overall electricity generation of the company. It was also stated that a deal with ‘GE’ Jenbacher, an Austrian company, was signed to install a dual fired combined cycle plant. This plant was to replace an old plant which had been built in 1978 and had already completed its life time, having its generation capacity limited to only 19% (Azm, 2014 : I). This project, if successfully completed and installed, would help in adding 560 megawatts of additional electricity. The project would involve the installation of 32 new gas engines that would increase the generation capacity of the company by 40%. The plant’s installation was agreed to take place in 4 phases and was expected to be completed by 2012. These grid stations were expected to contribute to increasing the voltage profile and energy production. A total of 1000 megawatts of electricity increase was expected to be achieved once the new grid stations project was fully delivered and started working.

The company also entered in a deal with a Turkish company that announced a barge-mounted power generation unit for Karachi. Once again, this power plant was supposed to increase 235 MW of electricity supply (Azm, 2009: I). Additionally, K-Electric also entered into industrial partnerships with other companies under the ‘captive power policy program’ to utilise the excessive power capacity of some industrial units. The company signed agreements

with Engro Polymer & Chemical Limited (EPCL) and IIL to supply additional megawatts of electricity to K-Electric. More recently, the company announced an investment of \$1 billion to construct a 660 MW coal-fired power plant. This plant, once in working condition, would replace an existing furnace oil plant having a capacity of generating 466 MW of electricity, and would be expected to be completed by the end of June, 2017 (The News, 2014).

In addition to the investment in the generation side of the business, the company transferred its grid operations to the SAP system. The SAP system was expected to manage and enhance the company's generation capacity along with upgrading and rehabilitating K-Electric's transmission and distribution (T&D) network. With the implementation of the SAP technology, K-Electric completely automated the processes around grid stations. Using SAP's advanced plant maintenance (PM) function, the company was harmonising the maintenance processes of the company's grid stations (Manross, 2013). Using the PM module, master data codes were created, thus automating the processing of non-scheduled repair requests. Access to the real time data hastened decision-processes about repairing or replacing equipment. It also scheduled preventive maintenance requests for the equipment installed at the generation plants. This preventive maintenance was claimed to have reduced the overloading of the network and the number of unplanned electricity breakdowns. The business users (employees) were also able to enter their maintenance requests via online entry point. The PM module integrated all aspects of the plant maintenance processes including planning materials and tracking costs, reporting and accounting in real time (Azm, 2009: I). As a result, the company expected a 45% reduction in electricity tripping in between high tension to low tension wire transfers by the end of May, 2009. Additionally, the company installed ABC (Ariel Bundled Cable) wires to control the power distribution from the transformers to minimise the chances of theft, power losses and health and safety hazards. The newly installed ABC wires require low maintenance as compared to the conventional copper or aluminium distribution network. As a result of all these changes, the company was sure of being able to increase 1010 MW of energy by the end of 2014 (Hasan, 2014: II).

5.8 SAP Supporting the Supply and Distribution (SD) Function

As mentioned earlier, the company's decision to implement the SAP solution was associated with two major reasons: firstly, its ability to automate all main business areas of the utility and, secondly, its compatibility with the long-term IT strategy of the company (The Nation,

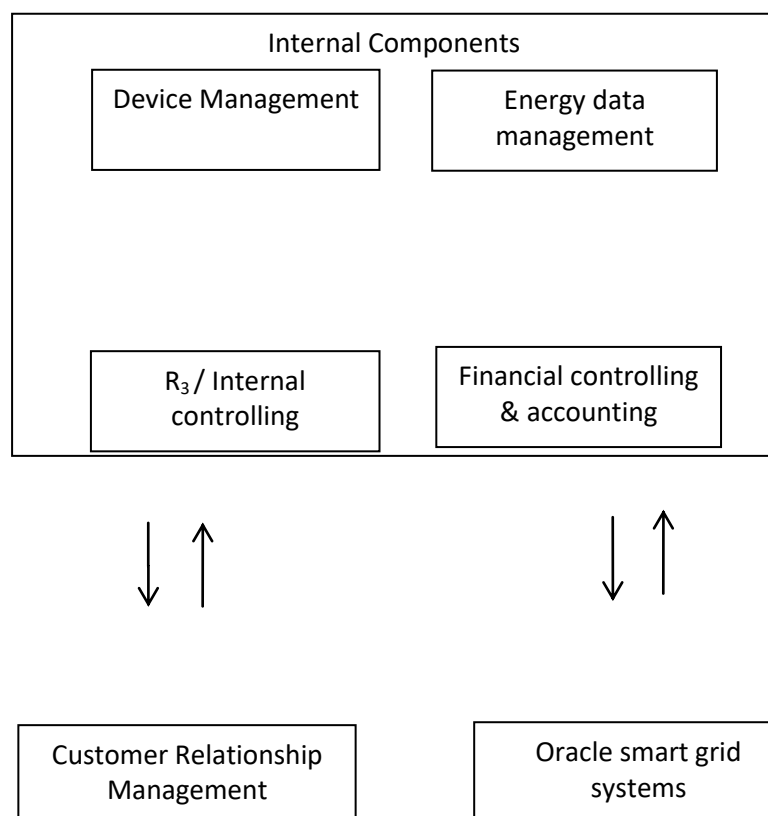
2009). As a result, the company decided to initiate the SAP ERP (Enterprise Resources Planning) project to support its supply and distribution function (KESC annual report, 2010). The physical attributes of SAP ERP and its hardware configuration/set-up were flexible and allowed other technologies to be integrated with it (Khan, 2014).

In the following section, a detailed discussion of both basic components and integrated components of SAP ERP is presented.

5.8.1 Architectural Design of the SAP ERP Project

The SAP ERP project was implemented in all 28 IBCs to integrate K-Electric's supply and distribution function and their execution under a single roof. SAP ERP had four basic components, namely: Device Management (DM), Energy Data Management (EDM), financial accounting and controlling that involved contract accounting and Billing and Invoicing (B&I), and Customer Care Services (CSS) (Manross, 2011). The architectural design of SAP ERP is given in figure 5.4 to help readers in understanding the different components/modules. With the help of the IT professional teams from Abacus Consulting and Infotec Pakistan Limited, the architectural design of the system was customised to serve the company's requirements (Abacus Consulting, 2014). This involved the integration of CRM and the smart grid technologies, and the customisation/centralisation of some advanced functions of SAP, including Material Management (MM) and Human Resources Management (HRM) (Manross, 2011) so that the employees could easily access these functions to perform the newly introduced tasks. What follows is a detailed discussion of these inbuilt and integrated functions of SAP ISU, as followed by the IBC employees.

Figure 5.4: The Architectural design of SAP ISU ERP Project.



Source: By the author

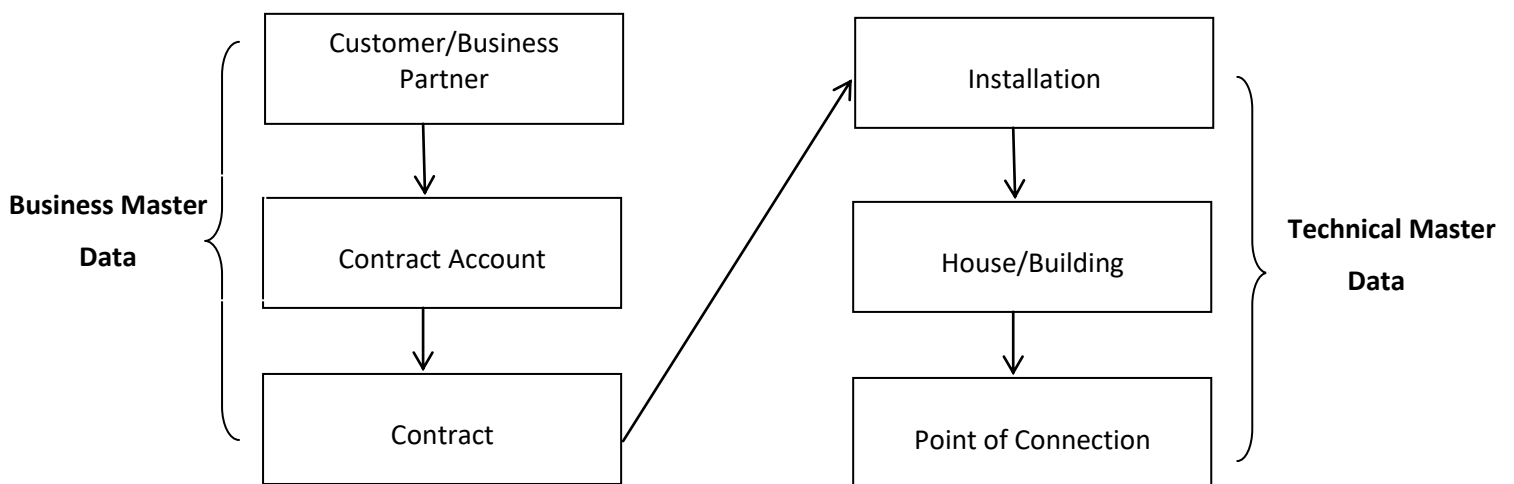
1. Device Management (DM) Component

The device management function provided K-Electric the opportunity to centralise its customer database (KESC annual report, 2010). The Device Management component included three sub components: device master data, device installation and meter reading (Azm, 2009: II).

As outlined in the internal newsletter (Azm, 2009: II), the implementation of the SAP-DM module would facilitate the company in managing both the technical master data and the business master databases by utilising its device master data component. The company purchased ‘common store’, a relatively cheap storage system, from IBM to support the storage of the old company data and integrate it with SAP ERP (The New Blue, 2010). It was decided that the master data would remain unchanged and only one version of the master data would be created and stored permanently. This data would be accessible across the business units and would help in controlling various business activities such as meter reading, billing, main-

tenance etc. The technical master data was used to store information about the technical aspects of the supply function including the installation or supply of electricity, the premises (building, house, factory) where the installation would be carried out, and the point of connectivity from where the supply would be made to the premises (Azm, 2009: II). The business master data stored and handled the information of its business partners (customers). The technical and the business master data co-existed separately and independent of each other. When a customer moved into the property and decided to sign the electricity contract with K-Electric, SAP automatically linked the technical and business data at that point and allowed the company to have greater visibility of the customer's activities. On the other hand, when any customer moved out of the property, the contract was terminated and subsequently the link between the technical and the business master data would be broken again. The link between this data type is further elaborated in figure 5.5.

Figure 5.5: Master Data Inter-linkage in SAP-ISU.



Source: Azm, 2009: II, p. 12

The device installation function of SAP included basic training for the employees concerned to make them understand the functional specifications and the usage of different devices, and to perform the maintenance of the technical devices (Azm, 2009: II). This function allowed the employees to look after and keep updated information about the certification of all devices used by K-Electric. The device installation would offer help with technical details, e.g. how to install the smart meters (part of company's long term strategy), and where the differ-

ent points of the installation would be located. New software components were also put in practice to upgrade the registration process to deal with candidates applying for new connections. The customers were provided with customer numbers, using which they could access the progress of their application for meter installation online.

The advanced meter reading option of SAP facilitated the workers with details about how to perform meter reading operations (AZM, 2009: II). It detailed the routes and schedules of the meter reading process. The automated requests for meter reading were generated by the system which provided details on when the meter reading was due, and assigned routes to meter readers for meter reading. As per the company's claims, the centralised master data allowed the revenue protection and recovery department within the IBCs to detect monthly losses on different meter routes. The company placed check meters on each transformer that helped them in identifying the meter reading routes with high theft (AZM, 2009: II). This real time data enabled the company to look after the causes of high losses in specific areas. According to the company officials, it was noted that that the customers were disconnecting the neutral, a component of the meter, from the meter to cause it to either run slowly or stop working (AZM, 2009: II). Consequently, the company decided to hire and train the staff for the meter inspector position. These meter inspectors would inspect meters of the routes assigned to them and would have the authority to confiscate meters if suspected of fraudulent activity. The advanced meter reading options also facilitated the business users (employees) on how to take/record the meter readings and how to process the data obtained through meter reading, what control parameters to use and, most importantly, how to upload the meter reading on the systems and validate the readings so that the customers were billed timely (KESC annual report, 2010).

2. Energy Data Management (EDM) Component

EDM was another advanced function of the SAP system fully integrated with the SAP technology. Utilising the EDM component, K-Electric would be able to maintain a centralised database for storing the energy data, such as the interval meter reading methods, scheduling dates, and setting up the energy rates and quantities (AZM, 2009: II). It was thus argued that SAP EDM would allow greater analytical capability through its use of the Business Intelligence system. Business Intelligence provides access to the past energy data presented in an analytical manner. Using this company's historical data, the trend can be analysed as it will

be organised and presented in the shape of charts and analytical reports, and thus can potentially improve the decision making process of the company (KESC annual report, 2010).

Implementing the EDM component, K-Electric created user profiles that were ready to be transferred across the company via an internal interface at any time as requested by the staff concerned (KESC annual report, 2010). The intercompany data exchange (IDE) function of EDM helped in the exchange of data across the company in a standardised format. It also enabled the integration of the cross company business processes such as contract accounting and billing. The user profiles created by EDM were being used by the employees working on the billing systems to manage and analyse the interval data, i.e. data generated at regular intervals, e.g. at the end of each month, energy consumption, and fluctuating energy prices at different intervals. For instance, if the tariffs are recently changed for per unit consumption of electricity in between a billing month, the interval data function will facilitate the company in charging different amounts for different time intervals in a single bill without affecting the billing methods. EDM can also interface with the automated meter reading systems.

3. Financial Accounting and Controlling Module

The financial accounting module helped K-Electric in monitoring the contract accounts, billing and invoicing components (Manross, 2011). What follows is a discussion of these two components.

A. Contract account

The contract account function of SAP acted as a point of agreement between the utility and its customers (KESC annual report, 2010). It was expected that this function would help the company in providing information on matters like the date a customer moved into a property, any changes that took place in the contract i.e. change of address, changes in the tariff rates, or the period when the contract ends. The contract account data was saved in the company's permanent (master) database and included basic information, personal data and contract related information about the customer. This data was stored by the company also to be utilised for integrating the CRM (Customer Relationship Management) function with SAP (Manross, 2011). The contract account data helped especially when the customers contacted the call centres or visited the customer complaints centre in person to make a request, complaint or to get a duplicate bill, as it required K-Electric's staff to ask and confirm the personal information for confidentiality reasons. Under the SAP system, any complaint or request was to be

entertained only upon the confirmation of personal details by the customer. Thus, K-Electric used the master data saved into the company's database to serve its customers (The New Blue, 2010).

B. Billing and Invoicing (B & I)

The B & I function of SAP was equipped to develop the rate structure, billing process and invoicing (Azm, 2009: II). The basic business processes of the billing function included the calculation of the consumption charges stipulated in the terms of the contract and agreed upon by the customers and the company. The consumption charges were determined with the help of the meter reading data entered into the system and the tariffs that were part of the monthly bill. A consumer bill was issued after including other charges such as VAT and charges for any extra facilities provided, e.g. installation charges. Afterwards, the invoices were generated and printed, and finally the bills were sent to the customers via e-mail or post. Apart from the above mentioned routine billing operations, the user profiles created in ED enabled the company to initiate advanced services such as online billing. The company used extra adds-on (middleware) to provide an interface where customers were able to access their accounts online (K-Electric, 2013). The customers could also register themselves for facilities like receiving bills on their mobiles. Using this advanced functionality, the company modernised its conventional payment methods that included in person payment by the customers. After the implementation of SAP ERP, the customers were able to pay their bills using the online facilities available on both computers and mobiles. An additional facility of automatic cheque printing (ACP) was implemented in the financial controlling module (Azm, 2009: I). This feature enabled the system to print cheques automatically once a payment was posted in the vendor's account. Traditionally, this activity involved manually consolidating the vendor's payment with cheque preparation and printing. It was argued that The ACP eradicated manual intervention that could well end up printing bogus cheques. The ACP also facilitated easy tracking of all payments made to the vendor, and provided detailed reporting to the manager. Additionally, the traditional methods of issuing bills were also changed. Subsequently, the customers were able to get a duplicate bill and print it online by entering their unique ID into the system without having to visit the customer complaint centre to report a lost bill (K-Electric, 2013).

5.8.2 The Customised Configuration of Additional Components Within the SAP System

As discussed at the very beginning of the chapter and repeated throughout the discussion, the company chose SAP ERP not only to utilise its internal components but also to integrate additional components in its original architectural design. Subsequently, a number of supplementary components including customer care services, material management and human capital management were added to the SAP ERP system. In the following section, details about these adds-on are shared.

1. Customer Care Services (CCS)

The customer care service, as claimed by the management, was a new concept to be applied in K-Electric's business processes (Shafa, 2014). The notion of customer care never existed in the history of the company (Azm, 2009: I). As per the new management's opinion, the company traditionally focused on its core business functions of generation, transmission and distribution (Azm, 2009: II). No visible effort was made to build a relationship with the customers and no resources were dedicated to customer service. The customers were perceived as characters of consequence in the company's business activity. Although there was a call-centre to record the complaints of the customers, the customer calls were hardly answered, if at all, due to a lack of staff (EMPEA, 2011).

After the privatisation, the CRM (Customer Relationship Management) component was implemented in all call centres of K-Electric. Once again, it was argued that CRM would significantly improve the quality of services being provided to its customers, because the CRM module would enable the company to monitor and control the complaint turnaround time – the time period in which a complaint gets resolved (KESC annual report, 2010). The new management stressed that the introduction of SAP-CRM was derived by its desire to manage the company's interactions with the consumers (Abbasi, 2012). This involved introducing a feedback mechanism where an e-mail address, i.e. customervoice@kesc.com.pk, was supposedly dedicated to get feedback from the customer on services provided by K-Electric's staff. The management asserted that they had established customer interaction centres both virtually and physically (Azm, 2009: II). Following this, the front office customer centres were established to facilitate face-to-face interaction with the customers. Additionally, K-Electric doubled the number of call-centre staff, to improve customer services. The Complaint Management System (CMS) software was installed, with a telephonic database of over 1 million

customers (K-Electric's internal briefing notes). The company stressed that CMS facilitated the tracking and monitoring of customer complaints and issued customers with auto generated complaint numbers. The CMS system provided information to the customer service staff about the faults at the grids, transmission lines, distribution lines or updates on failure at various residential locations. CMS stored customer home addresses that were transferred by the call centre employees to the staff responsible for maintenance, so that the system fault could be accurately located. The CMS software also helped the face-to-face point of contact offices and facilitated the process of customer complaints and follow-ups. The provision of the special help desk was started where the company staff assisted the customers with their issues and queries (Azm, 2009: II). Also, QMS (Quality Management System) was introduced to monitor the services provided by the staff to the customers at various IBCs and call centres (Azm, 2012). QMS ensured that the data stored in the system was accurate and quality standards and rules were followed by the employees working in the customer services department.

2. Material Procurement

After taking over the company, Abraaj Capital claimed to have invested 1 billion PKR (Pakistani rupees) in the purchase of material (Azm, 2009: II). It was also argued that unlike the traditional work arrangements of storing the material at one centralised store room, the procured material goods were being stored at 36 different locations (Manross, 2011). The company stated that under the old system, a material unit was actually considered 'consumed' if moved. This activity allowed a greater chance for fraudulent activities to take place, as the record of the consumed and available material was not generated accurately by the system. Using the material procurement component, the company configured its material procurement function and related activities taking place at these sub-stores with the SAP system. Using the material procurement function, information about the availability of material at different sites could be interchanged across all IBC branches. Additionally, the movement of material for different activities in the network, and the distribution was properly recorded on the system. Traditionally, only the central store of the company used to record this information. This allowed greater visibility and monitoring of the material stocks and gave actual representation of the available material and the real data on its consumption. This upgrade was supposed to help in quickly rectifying the power faults during the monsoon season, as the material from the closest location of the fault would be ordered and used to restore the power supply (Manross, 2011).

3 Human Capital Management (HCM) HR Module

Advanced functionalities were claimed to be configured into SAP's human resource module as well. Subsequently, payroll of K-Electric's employees was successfully transferred to the system (Manross, 2011). With the close collaboration of the company's newly established in-house IT SAP department, K-Electric introduced online hiring and recruitment processes carried out through SAP enabled applications (Azm, 2009: II). Not only did this function reduce the employees' work load and stress of manually maintaining the candidates' record, but also automated the candidates' initial screening out phase. Following this, only the short-listed candidates would go through further screening stages. The management, with the help of the foreign consultants, also initiated the technically equipped laboratory at K-Electric's training centre. This was supposed to provide a platform for testing the capabilities of the employees applying for various technical positions, so that the right candidate might be selected for the advertised job. Furthermore, all employees were issued a SAP generated employee number, a unique ID through which employees' record, e.g. data on salary, provident fund, benefits, etc., could be maintained and tracked (Manross, 2011). The HCM module used the KPI (Key Performance Indicators) component to measure the existing employees' performance (Azm, 2009: II). KPI is a measurable and comparable matrix that was used by the company to reward its employees based on their performance.

5.9 Effects of SAP Implementation on Society

Up to this point, the discussion within this chapter has focused on the decision of K-Electric's new management to implement the SAP technology for two main reasons: firstly, it was claimed that SAP is compatible with the long term IT strategy of the company and, secondly, it was presented as the best solution for the company's existing problem. As stated previously, soon after taking over K-Electric, Abraaj Capital, in various media interactions, highlighted three major problems surrounding K-Electric: a lack of investment in the generation capacity, leading to frequent energy breakdowns in different areas of the city, K-Electric's inability to recover the billed amount from both industrial and residential customers due to a lack of a proper billing method, and the non-existence of customer care services. It is also discussed how K-Electric claimed to overcome these problems by implementing the SAP system. In this section these three problems will be discussed again to provide insight on what actual effects the implementation of the SAP technology had on the business operations and customers of K-Electric. This section argues that despite the company's post-privatisation claims of repositioning the company as customer focused, K-Electric has neglected the cus-

tomers in the process of bringing large scale structural as well as technological change, thus disappointing society and making the change less appreciable, if at all.

5.9.1 Impact of SAP on Generation and Transmission Function

Contrary to the company's claims that additional generation capacity was successfully installed and that electricity breakdowns had been reduced considerably, the situation actually went from bad to worse (Shafa, 2014). Even in the year 2011, 2 years after the rolling out of the SAP project, K-Electric's own power production was fulfilling only half of the city's power requirements, and the company was still borrowing electricity from other sources to fulfill the energy requirements of the city (Abbasi, 2011). It was also reported that after the privatisation, i.e. since 2005, K-Electric witnessed a continuous drop in the generation capacity of its own power plants. The capacity decreased from 9129.68 KWh to 7826.27 KWh, while the contribution of the national grid increased from 3836 KWh to 5423 KWh (Abbasi, 2011). Although the management declared that 750 MW of generation capacity had been added by the end of June 2011, much of this capacity actually remained under-utilised. K-Electric claimed that they were not able to utilise the full capacity of their power plants due to the lack of gas supply (Bhatti, 2014), hence the increased number of blackouts were justified. The GOP (Government of Pakistan), on the other hand, dismissed the company's claims and maintained that K-Electric was supplied with subsidised furnace oil along with electricity supply from its national grid. Therefore, the government asserted that the low level of the availability of gas could not be an acceptable excuse for the company's inefficiency (Raza, 2014). In addition, the company was continuously using more than the sanctioned amount of electricity from the national grid (Hasan, 2014: II). Soon it became apparent that K-Electric, even after its privatisation, was proving to be a burden on the national exchequer.

It was evident that the company was steadily failing to meet the electricity demand as the number of blackouts had actually increased (Abassi, 2011). The worst blackouts continued to persist even in the month of June 2015, when the temperature in the city touched a new high of 45C. As reported by BBC News (2015), this was the most extreme heat wave ever experienced in the history of Pakistan. It was responsible for the deaths of over 800 people in the month of June alone. The BBC international report and the findings of NEPRA's inquiry, pointed out the inefficiency of K-Electric to provide uninterrupted power supply, in the hottest month, to be the main reason behind this calamity.

As per the government report, the real problem faced by K-Electric was still the lack of energy generation (The News, 2015). This was followed by another event where four major power breakdowns were experienced in the first week of July alone, thus plunging large portions of the metropolis into darkness for many hours at a time (Husain, 2015). Taking notice of the event, the provincial information minister, Mr. Sharjeel Inam Memon, termed this a 'criminal negligence' on the part of K-Electric's management, and even pointed out the possibility of arrest warrants being issued against them. As previously mentioned in the chapter, at the time of the takeover, Abraaj's management accused the previous management of not investing in generation capacity, due to which the energy generating systems became vulnerable to even the slightest rain and tripped immediately thus causing blackouts in the city. However, even after 5 years of leading the company, and despite the claims of investing billions of dollars in generation capacity, in the year 2014 the city faced the worst blackout at the very beginning of the monsoon season, i.e. with the first rain of the season (Patel, 2014). Altogether, 120 out of K-Electric's 1300 energy generating plants tripped, plunging the whole city into darkness, with electricity being restored in only 60% of the areas, on the day after the blackout (The International News, 2014).

The problem of blackouts persisted, despite the claimed advanced functionalities of the SAP system that were believed to provide real time information on load shedding schedules following which the blackouts would only be observed during the scheduled time announced by K-Electric (K-Electric internal briefing notes, 2009). The unannounced blackouts actually increased in number over the years. This resulted in public anger, more so because the blackouts continued to persist even after the government had issued a public notice, restricting K-Electric from practicing the blackouts in the city of Karachi (Patel, 2014).

Furthermore, the company was believed to be misusing its monopoly position in the Karachi region, as the feeder/plant tripping issue had become a fabricated response for the electricity breakdown (Yaqoob, 2014). The automation of the grid's operation and the implementation of the smart grid technologies was criticised strongly by both the media and various groups of society, as a way to control the electricity supply of the city. Additionally, the advanced functionalities of SAP, i.e. plant maintenance and preventive maintenance etc., that were claimed to improve the power plants' operation also could not yield the expected results. The company previously maintained that preventive maintenance would ensure that the staff con-

cerned were aware in advance of which plants were in need of maintenance, which equipment needed to be replaced, and the regular checking of the power plants (Manross, 2011). This improved maintenance was supposed to result in uninterrupted power supply to the customers of K-Electric. Unfortunately, these claims remained promises that the company never fulfilled in reality (Bhatti, 2014).

The occurrence of grid faults became a regular practice and the customers became increasingly dissatisfied with the way K-Electric operated. The customers started voicing their opinion that the company had used the technology to penalise them and the automation had made it easier for the company to randomly switch off the power supply to different regions (Yaqoob, 2014). The frequently occurring systematic power failure raised many questions regarding whether the company actually invested the amount in power generation as claimed on the website and press releases. Many societal groups claim that the tripping of feeders is not a truthful statement, 'it is actually a safeguard mechanism [for K-Electric] that is used to protect the power supply stations from huge loads. When a sudden spike in power comes at a station or sub-station, this mechanism automatically switches off the supply' (Yaqoob, 2014).

Adding to the series of accusations is the recent set of articles that links K-Electric's feeder tripping issue with the company's drive towards using cheaper methods of electricity generation, such as coal and gas plants (Bhatti, 2014). The company's plants keep tripping over and over again due to the lack of required gas pressure to run a plant. Additionally, using gas instead of furnace oil also affects the performance of power plants in the long run by damaging them. The decision to use cheap methods of electricity generation is derived from the company's motive to maximise their profits. In a recent inquiry set up by the National Accountability Bureau (NAB), K-Electric had been found guilty of stealing billions of rupees worth gas from the government owned Sui Southern Gas Company Limited, to run its electricity generating plants (Customs Today, 2014).

Another continuously prevailing problem on the distribution side of the supply chain is the significantly increasing amount of line losses (Haider, 2015). Once again, this problem continues to exist despite the company's claims, made soon after the implementation of SAP, that line losses will be immediately controlled. It was reported that at the distribution level, where electricity enters the lines and grid stations of 132kv or lesser voltage, the technical

losses were still around 20%, way higher than the international average losses of 6% to 8% (The Express Tribune, 2014).

This situation shows that the transmission and distribution systems are still as obsolete as they were before the implementation of the SAP system. With reports surfacing about underground cables and transformers being outdated, there will be no relief from the electricity breakdown in the city until and unless the whole system is improved (Haider, 2015). Consequently K-Electric has lost all its credibility in the eyes of its customers (Dawn, 2015).

5.9.2 New Methods of Billing and Invoicing in SAP

The new billing arrangements of K-Electric, that were put in place apparently to recover the company's losses due to non-paying customers, were also strongly criticised by both the customers and NEPRA (The News, 2014). The customers believed that the bill costs, issued despite the long hours of breakdowns being observed in many parts of the city, did not represent the actual consumption during a billing month. Additionally, the continuous increase in the per unit price of electricity despite using cheaper forms of electricity generation was termed totally unjustifiable (Yaqoob, 2014).

The customers complained that they were forced into paying for the many technological advancements put in place by K-Electric, that were helping K-Electric to maximise their returns instead of helping the customers. According to a customer's statement, as seen in Shafa, (2014), every month the bill comes with extra hefty charges under the heading of facility charges.

More recently, K-Electric had also been under the scrutiny of various media groups when reports of K-Electric's high officials being involved in overbilling the customers surfaced (Kiani, 2014). K-Electric, in a press meeting, diplomatically maintained that they had initiated an enquiry into the matter, but no such inquiry was ever carried out. The issue of fraudulent billing became more evident once the e-mails of K-Electric's high officials were leaked to the print media. K-Electric tried to cover up the whole story and immediately dismissed the accused manager. Mr. Shoaib Siddiqui, the general manager, admitted that "he issued directions to field formations to carry out excessive billing and issue detection bills" (Kiani, 2014). However, the media reports revealed that the general manager was made a scapegoat to save

K-Electric's damaged reputation and was later on accommodated in BYCO, a sister company of K-Electric, once again in a key post. Another executive, Mr. Arshad Iftakhar, was served a warning letter, but once the case was shelved he was promoted within the organisation.

It was also noticed that overbilling was not the only problem faced by the customers. The company was deliberately issuing wrong bills to inflate its profits (Kiani, 2014). When customers registered a complaint for rectifying a wrong bill, the staff always came up with an excuse that owing to specifics of SAP technological systems they cannot make any changes in the billed amount once the bill has been issued, and the only possible relief for the complainants is to pay the bill in installments (KESC complaints and reviews: wrong billing, 2014). In many instances, wrong bills were continuously being issued, even to commercial properties and households that had been vacant for quite some time. A consumer complained about his situation on the complaints board:

“Dear Sir, I am writing to raise complaint on my bill. I paid Rs.2500/= on 22 October 2010 after the due date that was 19 October 2010. In the running month - November - KESC [read K-Electric] charged me arrears billing of 8, 200/= I went to KESC office located at S.F AZEEM PURA SD-II 79-A BIG PLOT SHAH FAISAL COLONY NO.4. But their response was very uncooperative regarding the issue, as they told me once the bill is printed they lose the authority to correct it. You can just pay your bill in installments and they insisted that I submit the complete bill, which was 8, 200/.”

(4th December, 2010)

Another complaint on the (KESC complaints and reviews: wrong billing, 2014) page states:

“Dear Sir, in the month of October-2010, we received the bill for the month of September-2010, for Rs.37, 400/-, and due to some financial problems we had paid 16, 000/- as installments within the due date on 12-10-2010. Before paying this bill, we informed KESC's IBC based in Liaquatabad, Karachi through a letter that all the machineries/equipments have been shifted from this location and the area is lying vacant [and is no more a commercial property], so, please come and inspect/check the meter load so that you never issue access bill again and we can pay the bill according to the correct meter reading. But, nobody came and the bill is continuously being received every month without a meter reading. At present my mother lives here, she is the

widow of my father and she cannot afford to pay the excessively inaccurate bill.”
(17th December, 2010)

5.9.3 Rebranding of K-Electric as a Customer Focused Company

Like the other claims made by K-Electric, the improvement of customer care services as a direct result of SAP’s implementation also proved to be nothing but a publicity move (Shaikh, 2014). A customer, on his personal blog, narrated his own experience as:

“There is no doubt that they have tremendously improved their customer services. By improvement, I mean, a polite way to deny providing any information while still claiming to be customer centric. They basically neutralise customers. 90% of the time I cannot even make them provide any satisfactory information like why feeders are tripping so much and what K-Electric is doing to overcome these issues (They are doing nothing in case you are wondering).” (Yaqoobi, 2014: na)

In an article published in a reputable national newspaper, Shafa (2014) stated that, every day, K-Electric’s customer contact centres were inundated with customers complaining about the billing issue, yet their requests were not properly entertained, ‘as the company did not have the proper mechanism to address the consumer problems’. There are many complainants to whom the staff at the call-centre have stopped providing a complaint number, indicating that the complaints are not getting registered anymore. Whenever a customer complains about an electricity breakdown, they get a fabricated response that it is due to the feeder tripping (Shafa, 2014).

5.10 Conclusion

This chapter provides a detailed discussion on the inflated claims of K-Electric’s management about the benefits of implementing the SAP system to support business operations of the company. The case of K-Electric presents a tale of power (of management) and the opportunity (provided by the technology) to exercise it. The management envisioned and executed their desired goals through the affordances provided by technological artefacts. The chapter highlights the decision to implement the SAP system, where K-Electric was observed to be using technology to inflate its profits by overcharging customers, carrying out unannounced blackouts, and refusing to make corrections to wrongly issued bills (Winner, 1990). As discussed in this chapter, the implementation of the SAP technology was another attempt by the company to establish a technological system that could, apparently, express the organisa-

tion's desire to modernise and simultaneously work as a legitimate framework with components that could be manipulated to create a profit-generating mechanism. It was observed that elements of the SAP system, including the billing module, installation of SAP enabled smart meters, and the CRM system, were being used by the company to penalise customers and force them into paying more than was due (Kiani, 2014). On one hand, it was observed that the SAP supported automation of the grid function provided K-Electric with a mechanism to control the power supply of different regions as per their discretion (Shafa, 2014). On the other hand, the billing component was being used to issue wrong bills and to overcharge the consumers (Bhutta, 2015).

The chapter reveals, through the discussion of a series of events that took place as a direct result of the implementation of various components of SAP, that, contrary to the potential benefits of using a high-end technological system, SAP is actually being misused to generate profits for the firm (Dawn, 2015) instead of improving customer service or business processes. The chapter points out that various components of the SAP system were either especially customised or manipulated by K-Electric's management to make speedy gains on their investment.

Chapter 6: Power Practices of K-Electric as Afforded by The SAP Technology and the Weak Governance Mechanism

6.1 Introduction

This chapter focuses on a detailed discussion of the post-SAP implementation performance of K-Electric. In doing so the actual performance of the company is analysed against the company's self-proclaimed achievements to have a better understanding of the company's position in Karachi's context. In Chapter 4 of the thesis, a detailed macro and micro level analysis of the wider socio-economic context surrounding K-Electric and its strategic choices is presented (Peter, 2011). In Chapter 5 we discussed how the management of K-Electric, by abusing their monopoly, continued to utilise the contested affordances provided by the SAP technology despite facing strong resistance from various groups of society (Yaqoob, 2014). This was followed by a detailed discussion of both the actual and claimed usage of the SAP system and how it affects society as a whole. It was noticed that the company deliberately used various components of the SAP system to earn unjustifiable profits. In this chapter, greater attention would be paid to the increasing customer dissatisfaction in the post SAP implementation period of the company. The reaction of the citizens of Karachi towards the changed business practices adopted by the company will be elaborated. It will also be discussed how various components of SAP technology were specially customised (designed) to penalise the customers (specially middle and lower income group) in one way or another. This chapter will focus on the weak position of NEPRA in the power structure, and its poor governance that failed to restrain K-Electric from pursuing its own interests at the public cost. The last section will discuss in detail how the consumers were affected by the K-Electric's use of unlawful power practices to penalise the customers, despite presenting their new practices as an attempt to revamp the business processes of K-Electric and to rebuild it as a customer-centric company.

6.2 K-Electric's Continued Reliance on Government

The privatisation of K-Electric, supposedly undertaken to revamp the hopeless organisation, did not prove to be successful in enhancing the generation capacity, controlling the T&D losses, or satisfying its customers (Shafa, 2011). The available data suggested that even after its privatisation, the company was heavily reliant on government assistance (Raza, 2014) to support its routine operations. According to the SDPIs (Sustainable Development Policy Institute) report (2011), the total amount of subsidy paid by the government to K-Electric, for only the year 2011, was US \$551 million. This amount was greater than the total budget jointly allocated to the different sectors including health, education, research in science and technology, environment protection, housing and social protection (Abbasi, 2011). Table 6.1 shows the amount of subsidy given every year to K-Electric in the post-privatisation period. The table shows that after the takeover of the company by private investors, the amount of subsidy has continuously gone up.

Table 6.1. Subsidy Granted to K-Electric (2008-2011)

Year	2008	2009	2010	2011
Subsidy in PKR Million	17,282	26,950	33,220	44,581

Source: Reproduced from SDPI report 2011 (Abbasi, 2011, p. 30)

The data available on K-Electric's own website unveils the fact that the company also failed to meet the T&D targets set by NEPRA, time and again. Table 6.2 shows the goals set up for reducing the T&D losses in the privatisation agreement as opposed to the actual performance of the company in the period 2008- 2011.

Table 6.2. Comparison of Actual T&D Losses With Expected T&D Losses (Post Privatisation)

Comparison	2007-2008	2008-2009	2009-2010	2010-2011
Actual T&D losses	34	36	35	32
NEPRA's target	20	20	20	20
Total deviation	-14%	-16%	-15%	-12%

Source: K-Electric Annual Report 2010-11, p. 12

In the year 2011-12, when the company announced its first profit (Husain, 2014), the citizens of Pakistan living in other parts of the country started protesting against the provision of electricity to a private company from the national grid as it affected the power supply of other regions (Pakistan Today, 2014). The IMF, on the other hand, also considered the government's continuing support of K-Electric as unfavourable to Pakistan's economy and actually a possible/potential reason for Pakistan's inability to repay the IMF's loan in time (Mangi, 2014). As a result, the IMF pressurised the Pakistani government to stop providing any further subsidies including the free supply of electricity from its national grid, once the contract was over in January 2015, and pull out of any tax rebate/relaxations being given to the company (Raza, 2014). Although K-Electric was already in the news for its continued profitable run since 2012, the company's management was not convinced with the reduced role of the government as an aid provider (Hasan, 2014).

6.3 Tariff Structure of K-Electric

As stated in K-Electric's licensing agreement, the tariff structure of the company was to be determined by NEPRA under a fixed formula that was agreed upon at the time of the privatisation (NEPRA's Interim Report, 2010). As NEPRA was following the fuel adjustment policy for the increase and decrease in the tariff, the tariff structure was subject to a quarterly review to incorporate any changes in the fuel prices (Makhdoom, 2014). The post-privatisation tariff structure of K-Electric consisted of 5 tariff brackets to categorise the customers according to their consumption (NEPRA's Interim Report, 2010). These brackets, as initially set out in 2005, divided the consumption between 0-50 units, 1 and 100 units, 101 and 300 units, 301 and 1000 units, and above 1000 units. Since the company had been receiv-

ing varying amounts of subsidies from the state, the decision about the percentage of the NEPRA-determined tariff to be passed on to the consumers was entrusted to the government. The outstanding tariff balance was paid to K-Electric by the GOP as a consumer subsidy. Over a period of time, and as K-Electric started strengthening its operational network within Karachi, the GOP started reducing the consumer subsidy. Consequently, K-Electric started putting the tariff differential in the consumers' bills instead of paying it from the company's profits, as decided in the privatisation deal (NEPRA's Interim Report, 2010).

Despite the presence of a fixed framework with which to work out the tariff rate for K-Electric consumers, the tariff structure in the post-privatisation period has remained very unpredictable (NEPRA's Interim Report, 2010). Evidently, in the years 2009 and 2011, the tariff rate was adjusted or, in other words, increased four times a year. On the other hand, the energy rates for 2012 were kept constant throughout the year without any quarterly adjustments (Hassan, 2013). The tariff structure for the residential consumers along with the subsequent quarterly changes in the tariff during the post-privatisation period from 2007 to 2010 is given in table 6.5. The main focus of this thesis is the residential consumers, but for a better understanding of the post-privatisation changes, the tariff structure for the commercial (table 6.3) and industrial customers (table 6.4) after the year 2007 is also given.

Table 6.3 Quarterly Tariff Structure for Commercial Customers Category A-2 from 2007-2009

Commercial tariff A-2	Energy charges Ps/KWh	Quarter wise F.A.S Ps/KWh				Additional surcharge Ps/KWh
		January-December				
2007						
First 100 units	291	141	170	191		418
Above 100 units	315	141	170	191		430
2008						
First 100 units	291	218	246	284		418
Above 100 units	315	218	246	284		430
2009						
First 100 units	291	469	465	452	480	418
Above 100 units	315	469	465	452	480	430

Source: Compiled by the author data taken from NEPRA's official release to the company , high court and press release.

**Table 6.4: Quarterly Tariff Structure for Industrial Customer Category B1-B5 for The Period
2007-2009**

Industrial tariff	Fixed charges Rs/KW/month	Energy charges Ps/KWh	Quarter wise F.A.S Ps/KWh				Additional surcharge Ps/KWh
			January-December				
2007							
B1 upto 40 KW	--	186	156	185	206		337
B2 41 to 500 KW	300	135	156	185	206		250
B3 upto 1000 KW	290	134	156	185	206		234
B4 all loads at 66 and 132 KV	280	129	156	185	206		215
B5 all loads at 220KV and above	273	129	156	185	206		208
2008							
B1 upto 40 KW	--	186	233	261	299		337
B2 41 to 500 KW	300	135	233	261	299		250
B3 upto 1000 KW	290	134	233	261	299		234
B4 for all loads at 66 and 132 KV	280	129	233	261	299		215
B5 for all loads at 220 KV and above	273	129	233	261	299		208
2009							
B1 upto 40 KW	--	186	484	480	467	495	337
B2 41 to 500 KW	300	135	484	480	467	495	250
B3 upto 1000 KW	290	134	484	480	467	495	234
B4 for all loads at 66 and 132 KV	280	129	484	480	467	495	215
B5 for all loads at 220 KV and above	273	129	484	480	467	495	208

Source: Compiled by the author, data taken from NEPRA's official release to the company, high court and press release.

Table 6.5: Quarterly Tariff Structure for Residential Customers: Category A-1 from 2007-2010

Residential tariff (2007) In units	Energy charges Ps/KWh	Quarter wise F.A.S(Fuel adjustment sucharges) Ps/KWh				Additional surcharge Ps/KWh
		Jan-Apr	May-Aug	Sep-Dec		
0-50 units	61	--	--	--		79
1-100	46	189	218	239		174
101-300	63	189	218	239		247
301-1000	156	189	218	239		382
Above 1000	193	189	218	239		469
2008						
0-50 units	61	--	--	--		79
1-100	46	266	294	332		174
101-300	63	266	294	332		247
301-1000	156	266	294	332		382
Above 1000	193	266	294	332		469
2009						
0-50 units	61	--	--	--		79
1-100	46	517	513	500	528	174
101-300	63	517	513	500	528	247
301-1000	156	517	513	500	528	382
Above 1000	193	517	513	500	528	469

Source: reproduced and compiled by the author, data taken from NEPRA's official release to the company, high court and press release.

K-Electric, in its official documents as well as its own website, denies any involvement in determining the energy rates and designing the different tariff brackets for various categories of consumers – residential (lowest), industrial, and commercial (highest) (Company's Internal Presentation/briefing, 2013; K-Electric, 2014). However, the supporting evidence for such claims remains missing; as a matter of fact, these widespread tax brackets actually favour the company over the consumers. For instance, a customer consuming 301 units of electricity would be charged a tariff rate and VAT equivalent to that of a consumer that spends 1000 units a month. Hassan (2013) in his article asserts that only 25% [of Karachi's] population, consisting of the richest, consumes 700 or more units. Whereas, the majority [40%] of the people normally use between 0-300 units, and 34% use 300-700 units (Hassan, 2013). According to this data, the tax brackets were impractical and penalised the middle income group the most as they had to pay the same tariff paid by the richest 25% of society. There were numerous hearings against this illogical tariff-framing by NEPRA, where it was argued by the customers that it was not fair for a consumer using 301 units to pay the 301-1000 units bracket (Hassan, 2013). The defendants, i.e. officials from K-Electric, maintained that in such cases a person would pay for the first 300 units under the 0-300 tariff bracket and would be differently charged for the units consumed under the 301-700 units bracket. However, Kiani, in his newspaper articles (2013 and 2014), unveils that the company uses the technology [SAP system] to auto-generate bills, hence it is not possible for a mechanical system to charge a consumer in two different tax brackets simultaneously. Due to this computerised billing system, the entire bill is generated according to the tax bracket a consumer falls under. NEPRA revised the tax brackets for the first time after the privatisation in the year 2010. The total number of tax brackets was still the same, but this time the 301-1000 range was reduced to 301-700 units. Another tax bracket of 1000 units and above was reduced to 700 units and above. The revised tariff structure marked the inclusion of a fixed charge in the commercial tariff for the first time (NEPRA's Interim Report, 2010). The new tariff structure, like before, still did not favour the middle income group that constituted the majority of the city's population (Hasan & Mohib, 2003).

Table 6.6 Revised Quarterly Residential Tariff Category A-1 from 2010-2014

Tariff Brackets	Quarterwise Energy Charges (peak time)Rs/KWh				Quarterwise Energy Charges (Off-peak)Rs/KWh				Quarterwise Variable charges in Rs			
2010	January-December				January-December				January-December			
0-50 units	16.79	15.95	15.25		10.79	9.95	9.25		2.00	2.00	2.00	
1-100	16.79	15.95	15.25		10.79	9.95	9.25		10.49	9.65	8.95	
101-300	16.79	15.95	15.25		10.79	9.95	9.25		11.99	11.15	10.45	
301-700	16.79	15.95	15.25		10.79	9.95	9.25		14.19	13.35	12.65	
Above 700	16.79	15.95	15.25		10.79	9.95	9.25		15.79	14.95	14.25	
2011	January-December				January-December				January-December			
0-50 units	18.99	19.18	18.36	19.06	12.99	13.18	12.36	13.06	2.00	2.00	2.00	2.00
1-100	18.99	19.18	18.36	19.06	12.99	13.18	12.36	13.06	12.69	12.88	12.06	12.76
101-300	18.99	19.18	18.36	19.06	12.99	13.18	12.36	13.06	14.19	14.38	13.56	14.26
301-700	18.99	19.18	18.36	19.06	12.99	13.18	12.36	13.06	16.39	16.58	15.76	16.46
Above 700	18.99	19.18	18.36	19.06	12.99	13.18	12.36	13.06	17.99	18.18	17.36	18.06
2012	January-December				January-December				January-December			
0-50 units	21.19				15.19				2.00			
1-100	21.19				15.19				14.89			
101-300	21.19				15.19				16.39			
301-700	21.19				15.19				18.59			
Above 700	21.19				15.19				20.19			
2013	January-December				January-December				January-December			
0-50 units	23.01	20.78	21.48		17.01	14.78	15.48		2.00	2.00	4.00	
1-100	23.01	20.78	21.48		17.01	14.78	15.48		16.17	13.94	14.20	
101-200	---	---	21.48		---	---	15.48		---	---	15.60	
201-300	23.01/	20.78	21.48		17.01	14.78	15.48		18.01	15.78	16.10	
301-700	23.01	20.78	21.48		17.01	14.78	15.48		20.01	17.78	18.21	
Above 700	23.01	20.78	21.48		17.01	14.78	15.48		22.01	19.78	20.48	
2014	January-December				January-December				January-December			
0-50 units	22.46	22.18	21.94		16.46	16.18	15.94		4.00	4.00	4.00	
1-100	22.46	22.18	21.94		16.46	16.18	15.94		15.72	15.44	15.20	

101-200	22.46	22.18	21.94	16.46	16.18	15.94	16.76	16.48	16.24
201-300	22.46	22.18	21.94	16.46	16.18	15.94	17.49	17.21	16.97
301-700	22.46	22.18	21.94	16.46	16.18	15.94	19.58	19.30	19.06
Above 700	22.46	22.18	21.94	16.46	16.18	15.94	21.46	21.18	20.94

Source: reproduced and compiled by the author, data taken from NEPRA's official release.

In the last quarter of 2013, the tax brackets were once again modified, not in response to the severe criticism by the media and the society, but to adjust to the termination of government subsidies (Kiani, 2013). As a result, the tariff of almost every category increased drastically. The tariff for industrial customers increased by 46%, commercial consumers observed a 74% increase in the tariff, and residential customers, on an average, faced a tariff increase of 69% (Kiani, 2014: b). The revised tariff rate was estimated to raise PKR 252 billion against PKR 165 billion, as reported in the budget of 2013-14. Here, the aim of the government was to achieve the zero-subsidy budgetary target for the power sector (Kiani, 2013). This time, 6 tax brackets were introduced and the consumption was divided between 0-50 units, 50 to 100 units, 101-200 units, 201-300 units, 301-700 units, and over 700 units. The revised tariff structure from the year 2010 to 2014 is summarised in table 6.6 (for residential customers), table 6.7 (for commercial customers), and table 6.8 (for industrial customers).

Table 6.7 Revised Quarterly Commercial Tariff Category A-2 form 2010-2014

Commercial tariff	Fixed Charge Rs/KW	Energy Charges (Peak time) Rs/KW				Energy Charges (Off-peak time) Rs/KW			Variable charges		
		January-December				January-December			January-December		
2010		January-December				January-December			January-December		
Load less than 5 KW	400	17.79	16.95	16.25		12.29	11.45	10.75	16.29	15.45	14.75
Load 5KW & above	400	17.79	16.95	16.25		12.29	11.45	10.75	13.49/12.65/11.95		
2011											
Load less than 5 KW	400	19.99	20.18	19.36	20.06	14.49/14.68/13.86/14.56			18.49/18.68/17.86/18.56		
Load 5KW & above	400/400/400/400	19.99/20.18/19.36/20.06				14.49/14.68/13.86/14.56			15.69/15.88/15.06/15.76		
2012											
Load less than 5KW	400/400/400	22.19				16.69			20.69		
Load 5KW or above	400/400/400	22.19				16.69			17.89		
2013											
For less than 5 KW	400/400/400	24.01/21.78/22.48				18.51/16.28/16.98			22.51/20.28/20.98		
Load 5KW & above	400/400/400	24.01/21.78/22.48				18.51/16.28/16.98			19.71/17.48/18.18		
2014											
Load less than 5KW	400/400/400	23.46/23.18/22.94				17.96/17.68/17.44			21.96/21.68/21.44		

Load 5KW &above	400/400 /400	23.46/23.18/22.94	17.96/17.68/17. 44	19.16/18.88/18.64
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Source: reproduced and compiled by the author

As per 2013's tariff structure, the highest tariff was determined for the consumers coming under 301-700 units. This rule once again adversely affected the middle income group of the society, which constituted about 75% of Karachi's population (Hassan, 2013). Another major change was brought forward in the 0-50 units category. The tariff rate for this category was increased by 100% in the year 2013 from PKR 2.00 to PKR 4.00. This was followed by the logical criticism that the consumption of 0-50 units made it obvious that the properties/houses were vacant and there was no electricity consumption. Even NEPRA admitted that 'we are aware that people may be going away on a holiday for a month or two. They lock up their houses and do not consume electricity, hence, during this time they should not be made to pay' (Hassan, 2013). The business community and the affluent people of Karachi were also visibly upset with this new development. Their argument was that there should be a subsidy for the consumer group that spends 700 or more units in a month (Kiani, 2013).

Table 6.8 Revised Quarterly Industrial Tariff form 2010.

Tariff category industrial consumers	Fixed Price Rs/KW/month	Energy charges (Peak-time) Rs/KWh	Energy Charges (off-peak time) Rs/KWh	Variable charges
2010				
B1 Less than 5 KW (at 400/230 volts)	--	16.79/15.95/15.2 5	10.54/9.70/9.00	12.79/11.95/11. 25
B2 5-550 KW (at 400 volts)	400/400/400	16.79/15.95/15.2 5	10.54/9.70/9.00	11.39/10.55/9.8 5
B3 for all loads upto 5000 KW (at 11,33 Kv)	380/380/380	16.29/15.45/14.7 5	10.04/9.20/8.50	10.99/10.15/9.4 5
B4 for loads upto	360/360/360	15.79/14.95/14.2	9.79/8.95/8.25	10.59/9.75/9.05

5000 KW (at 66,132 KV)		5		
B5 for all loads upto 220 KV and above	340/340/340	15.29/14.45/13.7 5	9.54/8.70/8.00	10.59/9.75/9.05
2011				
B1 Less than 5 KW (at 400/230 volts)	--	18.99/19.18/18.3 6/19.06	12.74/12.93/12.11/12.81	14.99/15.18/14.36/15.06
B2 5-550 KW (at 400 volts)	400/400/400/400	18.99/19.18/18.3 6/19.06	12.74/12.93/12.11/12.81	13.59/13.78/12.96/13.66
B3 for all loads upto 5000 KW (at 11,33 Kv)	380/380/380/380	18.49/18.68/17.8 6/18.56	12.24/12.43/11.61/12.31	13.19/13.38/12.56/13.26
B4 for loads upto 5000 KW (at 66,132 KV)	360/360/360/360	17.99/18.18/17.3 6/18.06	11.99/12.18/11.36/12.06	12.79/12.98/12.16/12.86
B5 for all loads upto 220 KV and above	340/340/340/340	17.49/17.68/16.8 6/17.56	11.74/11.93/11.11/11.81	12.79/12.98/12.16/12.86
2012				
B1 Less than 5 KW (at 400/230 volts)	--	21.19	14.94	17.19
B2 5-550 KW (at 400 volts)	400/400/400	21.19	14.94	15.79
B3 for all loads upto 5000 KW (at 11,33 Kv)	380/380/380	20.69	14.44	15.39
B4 for loads upto 5000 KW (at 66,132 KV)	360/360/360	20.19	14.19	14.99

B5 for all loads upto 220 KV and above	340/340/340	19.69	13.94	14.99
2013				
B1 Less than 5 KW (at 400/230 volts)	--	23.01/20.78/21.4 8	16.76/14.53/15.23	19.01/16.78/17.48
B2 5-550 KW (at 400 volts)	400/400/400	23.01/20.78/21.4 8	16.76/14.53/15.23	17.61/15.38/16.08
B3 for all loads upto 5000 KW (at 11,33 Kv)	380/380/380	22.51/20.28/20.9 8	16.26/14.03/14.73	17.21/14.98/15.68
B4 for loads upto 5000 KW (at 66,132 KV)	360/360/360	22.01/19.78/20.48	16.01/13.78/14.48	16.81/14.58/15.28
B5 for all loads upto 220 KV and above	340/340/340	21.51/19.28/19.9 8	15.76/13.53/14.23	16.81/14.58/15.28
2014				
B1 Less than 5 KW (at 400/230 volts)	--	22.46/22.18/21.9 4	16.21/15.93/15.69	18.46/18.18/17.94
B2 5-550 KW (at 400 volts)	400/400/400	22.46/22.18/21.9 4	16.21/15.93/15.69	17.06/16.78/16.54
B3 for all loads upto 5000 KW (at 11,33 Kv)	380/380/380	21.96/21.68/21.4 4	15.71/15.43/15.19	16.66/16.38/16.14
B4 for loads upto 5000 KW (at 66,132 KV)	360/360/360	21.46/21.18/20.9 4	15.46/15.18/14.94	16.26/15.98/15.74
B5 for all loads upto 220 KV and	340/340/340	20.96/20.68/20.4 4	15.21/14.93/14.69	16.26/15.98/15.74

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Source: reproduced and compiled by the author

More recently, in the year 2014 and after 6 years of continuous increases in the tariff despite the news of four consecutive profitable years for K-Electric, NEPRA finally announced a major cut in electricity prices. The orders were issued and the reduced tax rates were circulated as well. However, as per the latest reports of 2015, the customers have not yet received any tax rebate from the company and the company has taken a stay order from the high court claiming that passing on the reduced-tariff benefit to the consumers will put K-Electric back in financial trouble (Makhdoom, 2014).

6.4 NEPRA’s Weak Position in Power Structures

The case of both Argentina and Chile highlights the role of a powerful regulator in the post-privatisation success of the power sector (Stern, 2000). In Pakistan’s case, contrary to these, NEPRA visibly failed to protect the interest/rights of K-Electric’s consumers and to ensure an affordable and reliable electricity supply in the city. NEPRA, that was initially established to monitor and maintain transparency in the private power companies’ operations, failed to establish itself as an independent and powerful regulator (Abassi, 2012). As we shall discuss in this section, the powerful private investor [K-Electric] continuously failed to meet the terms of the privatisation contract, became involved in un-ethical and corrupt means to maximise their profit, ignored many instructions from, and refused to pay the penalties imposed by NEPRA (SIDP, 2014). All of these actions clearly violated Rule 8 (3), as stipulated in the NEPRA licensing (generation) rule of 2000, and NEPRA could have suspended or revoked the issued license under section 28 of the NEPRA act for consistent failure of the licensee to comply with the conditions of the license (Abbasi, 2011); but, this did not happen and NEPRA’s failure to do so further emboldened K-Electric.

At present, NEPRA has many on-going cases against K-Electric and a list of previous cases with most of them proved against the company. Table 4 of the chapter lists these cases along with the findings of each case, and the decision taken by NEPRA in a chronological manner. Along with the company’s dismal performance in reducing the T&D losses, there was no improvement at all in the endemic electricity shut down problem. Reports even claim that the

citizens of Karachi are facing the worst ever energy crisis of recent times (Makhdoom, 2014). According to the data available with NEPRA, this problem is a direct result of K-Electric's failure to abide by the privatisation agreement according to which K-Electric was supposed to invest 361 million dollars in enhancing the generation capacity over a period of 5 years (The Express Tribune, 2014). K-Electric officials claimed that they had invested in the generation capacity by adding 450 MW of additional capacity, as opposed to the data available with NEPRA that revealed only 95 MW of additional capacity had been added by 2010 (Dawn, 2010). NEPRA issued a number of warnings to K-Electric to improve its generation and reduce electricity breakdown in the city. One of the members of NEPRA, during a court hearing, asked for evidence of their claims:

“Now if you are claiming that the generation capacity has been increased by 450MW, then you have to provide details of this addition in writing to Nepra.” (Maqbool Ahmad Khawaja, as quoted in Dawn, 2010: na)

In 2009, after only one year of privatisation, K-Electric was found to be involved in a series of violations of NEPRA's licensing agreement. As discussed earlier in Chapter 5, K-Electric was not only generating power from its own plants, but also purchasing power from other sources including IPPs (Independent Power Producers) and the state-owned NTDC (the national transmission and dispatch company). Moreover, NEPRA received complaints that K-Electric was not clearing the outstanding payment due to the IPPs and NTDC. Additionally, K-Electric, that signed a five-year deal with the government to purchase a fixed quantity of 650MW from NTDC, was continuously using more than the sanctioned power supply (Makhdoom, 2014). Therefore, NEPRA set up an enquiry to investigate the said allegations and asked K-Electric to provide detailed reports. K-Electric's delay in submitting the required facts in writing was followed by the imposition of a penalty, worth PKR 60 million, on the company (NEPRA's interim report, 2010).

In the year 2012, NEPRA filed a case against the utility after increasing customer complaints about unjustified bills that did not reflect their actual electricity usage. In October 2012, the enquiry committee submitted their report on the case confirming K-Electric's involvement in misusing the technology to overcharge customers by various means (Kiani, 2014). NEPRA's completed inquiry report confirmed the involvement of the bosses, including a former managing director of K-Electric, in deliberately ordering overcharging of the customers in order to inflate their profits. The findings of the report revealed that every single customer was be-

ing charged an extra 50 units that they had never consumed. On the other hand, too many detection charges were being imposed in the bills that K-Electric failed to justify or explain to the committee. Since K-Electric could not deny the facts presented by NEPRA, the high officials of the company accepted the charges. Consequently, NEPRA imposed another penalty of PKR 60 million on the company, but the powerful private investor refused to pay the fine and filed a civil petition in the high court, challenging NEPRA's decision. The company made a plea in the court that they were not aware of this act of managerial corruption. The company also tried to clear its position by explaining that legal action was taken against the managing director and, as his involvement in the scam was confirmed, the company sacked him at once. The detailed report issued by NEPRA reported that K-Electric did not record some emails that were provided during the inquiry 'which was sufficient to prove the involvement of the senior management' (Kiani, 2014: na). The regulator stressed that the company tried to cover up the issue by concealing the facts, although the contents of the e-mails made it clear that K-Electric had been issuing such directions to the field formations on a regular basis.

In 2013, NEPRA registered another case against K-Electric claiming that the bills were being issued without observing the code laid down in the consumer service manual (Kiani, 2014: b). According to the generation and licensing agreement issued to K-Electric by NEPRA, the utility was allowed to charge each customer PKR 2.00 every month for bill-collection. These charges were later increased by NEPRA to PKR 6.23 on K-Electric's request. Later on, it was discovered from the consumer bills that K-Electric was charging PKR 6.23 plus an additional amount of PKR 8.00 every month as bill-collection charges. Subsequently, NEPRA issued an order that this wrong billing practice should be stopped at once and the company should pay back this cost to the consumers immediately.

Abraaj Capital at the time of purchase of K-Electric had accepted a claw back mechanism, included in the company's approved tariff for 2009, that stated that a pre-agreed portion of the profit earned by the company would be used to provide relief to the customers in the form of subsidised electricity (Bhatti, 2014). K-Electric, that made a profit of PKR10,270.976 million in 2011-12, 17,864.770 million in 2013, and 28.3 billion in 2014 (The Express Tribune, 2014: II), refused to fulfil their promise after receiving a notice from NEPRA. According to the terms of the contract, K-Electric had to pay back PKR 4,522.996 million to its customers. NEPRA issued an order that the customers should be given a relaxation of 42 p per unit price

of electricity during the billing months of December and January 2014. In response to the NEPRA decision, K-Electric obtained a stay order from the Sind High Court against NEPRA's decision, claiming that the company was in dire need of investment and therefore could not share the profit with the customers at that stage (Bhatti, 2014). When the high officials of K-Electric were contacted and questioned by some media groups about this breach of the contract, they, in an attempt to justify their inability to accept NEPRA's decision, tried to portray that the company was still unstable. These claims were directly at odds with the self-lauded improvement in K-Electric's performance, and thus raised doubts about the pre-tax earnings of the company that kept increasing ever since the first profit was announced in 2012. Moreover, the gross profit reported by the company in the year 2014 was twice the amount earned in 2013 (Business Recorder, 2014).

The act of penalising customers continued in 2014. The regulator, once again, charged K-Electric with being guilty of misrepresentation, as the company, in the month of November 2014, charged its consumers for fuel cost which was actually lower than that mentioned by the company (Ahmadani, 2015). Reports revealed that 'the fuel cost on power generation during the month of November was registered low in comparison to the referenced fuel cost for the month'. Moreover, NEPRA's inquiry revealed that that K-Electric was, on purpose, using the wrong readings taken during peak periods to overcharge their customers throughout the year. (Kiani, 2014: na). Subsequently, NEPRA issued the company a notification to repay the over-charged amount to the consumers through tariff-relief. However, K-Electric, to date, has not repaid these charges to the consumers, and the charges against the company are still outstanding (Ahmadani, 2015).

In the same year, 2014, the prime minister announced a reduction of PKR 2.33 in the power-tariff charges. K-Electric once again refused to pay this subsidy to the customer, thereby causing anger amongst the consumers (Makhdoom, 2014). The heads of two prominent political parties of Karachi, MQM and Jamat-e-Islami, urged the government to enforce the reduction and give relief to the consumers. The consumers and the business community accused K-Electric of misusing its monopoly status in the region and putting the consumers in trouble to ensure healthy returns for itself (Makhdoom, 2014).

Once again in 2014, the customers of Karachi faced one of the worst blackouts, where 1300 power generating feeders stopped working simultaneously (Patel, 2014). This was followed by public outrage, not least because the electricity connection was lost, but also due to failure of the company to restore the power supply, even after 2 days of the power breakdown. The NEPRA's inquiry report of the matter unveiled that poor or no maintenance of the power plants lead to them malfunctioning (The International News, 2014).

On the other hand, the issue of under-utilisation of K-Electric's own generation capacity was impending since 2009 and persisted throughout the year. 'NEPRA expressed concern about the reduced power generation from the organisation and instructed K-Electric to produce energy by utilising all the production capacity (Dunya news, 2015). In 2015, NEPRA's vice chairman indicated that K-Electric generated 487 million units in December using its own power plants, which dropped to 433 million units in January. He stressed that the company should have produced more instead of generating less electricity, resulting in the increase in the electricity price' (Bhutta, 2015: na). The members of NEPRA confirmed 'that the decreased energy supply by K-Electric, , was a violation of Section 2.1 of NEPRA's licensing agreement. It has been negatively impacting the country's economy as the citizens of the rest of the provinces were facing power outages due to the electricity supply to K-Electric' (Dunya news, 2015). The chairman of NEPRA, while sharing his grave concerns with media persons, said it needed to be considered seriously that 'K-Electric got 650 megawatts (MW) of electricity from the National Transmission and Dispatch Company (NTDC) and continued to under utilise its own capacity' (Ahmadani, 2015). Along with NEPRA, the business community, political parties and members of the trade association expressed their concerns that 'K-Electric deliberately avoided utilising its own power plants to their maximum capacity in order to save on furnace oil costs, which is why the generation of K-Electric's own power plants has significantly decreased' (Dunya news, 2015).

In 2015, Pakistan experienced a scorching heat-wave with temperatures rising up to 45 degrees. NEPRA had previously issued instructions to K-Electric to provide uninterrupted power supply to its consumers so as to maintain air-conditioning and other important systems. Dismissing the orders of NEPRA (as a usual practice), the company not only continued the electricity disruption but also increased the hours of blackout. As a result the city of Karachi faced its worst ever calamity where the heat-wave and non-supply of electricity together took the lives of over 1100 people (Dawn, 2015). This incident of negligence on the part of

K-Electric received international coverage, with the BBC reporting this as a crisis needing urgent systemic reform (BBC News, 2015). The spokesperson of NEPRA in a press conference held soon after the incident asserted:

“The duration of loadshedding¹ [blackouts] in the city of Karachi had extended from 12 to 96 hours at a stretch, contrary to the utility’s claims of eight to 10 hours of load shedding also against NEPRA’s orders to avoid the practice of blackouts.” (As seen in Dawn, 2015: na)

In the same month of July 2015, 4 major power breakdowns occurred once again, making it obvious that the company had (practically) not invested in the improvement of its power plants and was not interested in maintenance of these plants due to the costs involved (Husain, 2015). As seen previously on various occasions, this time again NEPRA issued warnings to K-Electric for their misconduct alongside warranting serious action against the utility if the company continued to ignore instructions issued by NEPRA.

In 2015, after a series of impending charges and the non-responsive attitude of K-Electric, NEPRA finally issued a show-cause notice to the company (Dawn, 2015). The spokesperson of K-Electric informed media that at the time of privatisation the government supported the utility by providing them with PKR 13 billion to deliver improved power generation, transmission and distribution, but it failed to do so. Subsequently, NEPRA has imposed a penalty of PKR 100 million on the utility due to its involvement in serious violations of the NEPRA ‘agreement and licensing conditions’ (DAWN, 2015). The spokesperson also stressed that in the past NEPRA had twice imposed penalties on the company due to its misconduct, but both times K-Electric obtained a stay order from the court, mentioning its financial instability as the reason for non-compliance. He informed the media that these penalties still remain unpaid as the court order is in place, but NEPRA is now planning to take the matter to the Supreme Court. During this press meeting that was chaired by chairman of NEPRA, the spokesperson revealed the following important facts from their inquiry report.

“The KE management refused to provide information and data to the inspection team of NEPRA.... [later on] provided forced access to data but it was found to be inaccurate on verification and it was established beyond doubt that wrong reports had been given to the team.... the KE was required under the agreement to increase its generation capacity by 1,000MW

over the past three years, but an investigation found that it added 1,034MW to the capacity but closed some old plants generating 635MW. This indicates that the KE has a net capacity addition of only 349MW against the requirement of 1,000MW under the agreement. Giving details of the Rs13bn provided by the government to the KE, the spokesperson said the agreement required the utility to spend Rs6bn on its transmission system, Rs3bn on its supervisory control and data acquisition system, and Rs4bn on upgrading its distribution system, but the company has not invested in its transmission and distribution system. He [further] said the agreement required the company to invest \$369m between 2009 and 2011, but the fact-finding team did not find any evidence to suggest that it had done so.’ (As seen in Dawn, 2015: na)

As discussed in this section, K-Electric’s power play can be associated, at least partly, with NEPRA’s inability to exercise its due power to enforce its decisions on K-Electric. As a result, K-Electric’s management was given free hand to indulge in unethical means of doing business and generating revenue through unjustifiable practices including corruption at both organisational and personal levels (Kiani, 2014). Given the power of K-Electric, the role of NEPRA was reduced to tariff-determination, which can otherwise be done through a simple software application (Abbasi, 2012).

Table 6.9: Year Wise Time Line of NEPRA’s Cases Against K-Electric

NEPRA cases against K-Electric	Findings	Decision
<p>July 2009</p> <p>Case no LAG-05/6947</p> <ul style="list-style-type: none"> -Persistent violence in terms of successive power breakdown, irregular electric power supply. -under-utilization of its available generation capacity. -Non-payment to NTDC (national transmission and distribution company). - Continuous failure to pay to IPPs partner Gul ahmed company. - Non-compliance with the 	<ul style="list-style-type: none"> - The appointed committee’s investigation reveals many acts of omission on part of licensee (K-Electric). -K-Electric officials in court hearing admitted that due to financial constraints they have been unable to pay for purchase of electricity from both NTDC and the IPP. 	<ul style="list-style-type: none"> -NEPRA issued notice to K-Electric to explain its position.

<p>terms and conditions of its generation and distribution license.</p> <p>-Using electricity in excess of allocated 650 MW from the NTDC, the national grid.</p> <p>-Non-submission of information reports ordered by NEPRA.</p> <p>- Massive power breakdown on 17th and 18th June, power supply restored after 18 hours. (NEPRA's press release, 2012)</p>	<p>-Company also admitted having underutilized the generation capacity of its own generation plants in last quarter of 2008 (October to December).</p> <p>(NEPRA's press release, 2012)</p>	<p>-A penalty of 60 million to be paid to the NEPRA.</p>
<p>2011</p> <p>-Dissatisfactory methods of meter reading.</p> <p>-Not taking consent of the concerned authorities in making decisions.</p> <p>(Bhutta, 2011)</p>	<p>-K-Electric making excuses to fall short of its obligations continuously.</p> <p>- K-Electric laid down 4,500 employees without taking Sindh government or NEPRA in confidence.</p> <p>-Karachi faces worst energy crisis.</p>	<p>- Issued orders to adopt proper meter reading methods.</p> <p>-Warned K-Electric against the misconduct.</p>
<p>NEPRA cases against K-Electric</p>	<p>Findings</p>	<p>Decision</p>
<p>June 2011</p> <p>-K-Electric is a defaulter as it does not clear the payment of 12.916 million PKR for power purchased from various sources including NTDC, IPPs and PSO.</p> <p>(Abbasi, 2012)</p>	<p>The inquiry suggested that K-Electric was deliberately using delaying tactics to repay the amount.</p>	<p>NEPRA ordered for the over dues to be cleared at once.</p>
<p>October, 2012</p> <p>NEPRA received a number of complaints referred through the supreme court alleging the K-Electric officials of overbilling the consumers</p> <p>(Kiani, 2013; 2014).</p>	<p>The managing director Mr. Shoaib Siddiqui confessed that he was issuing these orders personally and denied any involvement of company in it.</p> <p>Another executive Mr. Iftikhar was issued a warning by the company.</p>	<p>NEPRA issued a heavy fine as the K-Electric concealed the facts from NEPRA that constitutes violation of the provision of section 44 of the (NEPRA) Act, Rule 20 of NEPRA Licensing (Distribution) Rules 1999 and Article 15 of KESC's distribution license.</p>
<p>December 2013 13300-13301</p> <p>-K-Electric charging</p>	<p>The NEPRA appointed committee reveals that bill collection charges were approved by NEPRA @2.00 Rs</p>	<p>NEPRA issued an order that this overcharging must be</p>

extortion by putting an unauthorized amount from customers in the name of bill collection charges (the express tribune, 2015)	in 2002. These charges were recently enhanced to 6.23 Rs. The K-Electric was found to be charging customers 6.23+ 8.00Rs as collection charges.	stopped at once.
March 2014 -Under-utilization of its available generation capacity.(Bhutta, 2015) -Failure to pass on the reduced tariff to consumers in the billing.	The K-Electric was on purpose under utilising their power plants in order to save the fuel oil cost.	Impending decision.
2014 -Major power generating plants breakdown (Patel, 2014).	Poor maintenance of power plants caused them to stop working time and again	Warnings issued to comply with NEPRAs instructions.
NEPRA cases against K-Electric	Findings	Decision
July 2015 -Heat-wave incident killing 1100 people (BBC News, 2015).	K-Electric ignored NEPRAs warnings against blackouts to be done in the hottest month of July. Up to 96 hours of blackout experienced in a single stretch without break.	NEPRA has issued a show-cause notice and imposed PKR 100 million penalty on the company.
July 2015 -4 major breakdowns in the city (Husain, 2015).	- Inquiry report revealed that K-Electric had not invested the claimed amount in improving the electricity generation	NEPRA has issued a show-cause notice and imposed PKR 100 million penalty on the company.

Source: Compiled by the author

6.5 Societal Resistance

This section of the chapter will discuss how K-Electric failed the customers' expectations at both ends, i.e. ensuring uninterrupted electricity supply and satisfying the customers by main-

taining transparency in the billing process. As discussed earlier in the chapter, the customers of K-Electric were suffering because of a series of factors, including the monopoly status of K-Electric in the Karachi region, corruption at managerial level, and NEPRA's weak position as an independent regulator.

Although the focus of this thesis remains the residential consumers, the reports suggest that the commercial and industrial consumers seem equally disappointed by K-Electric's work-practices. The increasing number of unscheduled blackouts was posing a threat to their business's prosperity. Every other day, K-Electric cuts the power supply without any notice; as a result, machines cannot be put to proper use and businesses are affected to a great extent. Owing to this problem, many businessmen and industrialists have shifted their factories to neighbouring countries like Bangladesh and India (Lerner et al., 2012).

The residential consumers also had many concerns about the way the company operated using the new operational work arrangements. The customers said that they were facing the problem of endemic blackouts, low voltage¹, unjustified bills, and non-cooperation of K-Electric's staff. One of the respondents shared that:

“In our area we are facing the problem of low voltage due to which many of our electric appliances, including ACs (Air Conditioners) do not work and electricity keeps tripping; we launched a complaint 3 years ago, but the problem was still pending.” (Interview, 6th March, 2015).

What follows is a discussion on different aspects of K-Electric's policies and its customers' increasing dissatisfaction with its operations.

6.5.1 Unethical Behaviour of K-Electric

As discussed in Chapter 4 and 5 customers were being penalised by the application/misuse of both technology and authority in many ways. This section in particular deals with the practice of unjustifiable 'detection charges' being included in customer bills, with the intention of increasing profits. As defined in the SDPI (2014) report, a heavy penalty is applied to the bill if the consumer is found guilty of deliberately slowing down the meter reading or using an illegal wired connection. Like many other complaints, the practice of detection charges being

received by the consumers also increased significantly post the implementation of SAP system technology. One of NEPRA's reports confirmed that K-Electric's field staff received special instructions from the management to issue excessive detection bills (Kiani, 2014). During the data collection it was identified that the detection charges were being added to the consumers' bills without enough evidence at hand about the misuse of the meter.

An elderly customer shared his frustration:

“My son usually noted the meter reading every month, but he was out of the town for holidays when the detection team visited. The team informed me that my meter had malfunctioned and since I did not report this to the company, they would put detection charges in my bill. In addition to that, the company would see the highest meter reading recorded on their billing system against my meter, and I shall be charged every month according to that highest meter reading for the rest of the year. I told them that I was above 60 and that I did not know how to take the meter reading or check whether the meter was running slow. Even then, I apologised and asked them to change the meter the very day, but they did not take back their decision.” (3rd March, 2015)

Another interviewee told me an extreme case of unfair detection:

“In 2011, the detection teams came for a sudden visit in our area and caught my neighbour using an illegal wired connection. The team later found that my neighbour was the brother of a K-Electric officer, since the team had to put detection charges somewhere they put these charges in my bill as my meter was fixed next to that of my neighbour. I raised the issue so many times and asked the company to start an enquiry and remove the detection charges from my bill, but instead of removing the detection, they asked me to clear my bill or else they would cut my connection.” (27th February, 2015).

The company has recently started rolling out a project of installing smart meters by replacing the old ones supposedly to restrict the misuse of meters by the consumers (Khan, 2014). The project is supposed to be completed by the end of 2015, where the whole city of Karachi would be shifted to smart meters by replacing the old ones. This move is also criticised as being anti-customer, because the newly installed smart meters are observed to be the fastest

running (Dunya news, 2015). The consumers who have already been shifted to the smart meters claim that they run a lot faster than the old ones and that their bills have considerably increased after the installation of the smart meters (Dunya news, 2015). Even during the data collection, many respondents said that they were unhappy with their bills and they were sure that they did not reflect the actual amount of electricity they were consuming every month. When the decision to install the smart meters was announced, it was also made public that the cost of this technology would be included in the customers' bills over a specified period of time (The Express Tribune, 2014). This was in direct violation of K-Electric's privatisation deal, according to which the company was not authorised to pass on the investment costs to the consumers (NEPRA's Interim Report, 2010).

6.5.2 Corruption at the Managerial Level

The technology was being used not only to generate revenue through unfair means, but also to extract an unjustified amount of money from the consumers that was later being taken by the high officials of the company for personal use. The NEPRA report, that revealed the unfair detection charges being added to the customers' bills, also reported that all the regional heads of IBCs, responsible for collection from their allocated areas, issued orders to include excessive units worth 10 million in the billing for the month of September, 2012. This excessive billing was being accommodated using the SAP system, where every single customer of K-Electric was issued with 50 extra units on their bill (Kiani, 2014). One of the company's employees, after being assured confidentiality, shared his views:

“Recently, our GM [head of an IBC division] got transferred because a few employees launched a complaint against him and provided the board of directors with proof including videos and leaked e-mails that confirmed he was usurping a good amount from the targeted cost to be recovered from the customers of our allocated division.”
(28th February, 2015)

The major political parties of Pakistan also criticised the so called success of the company, that was apparently being measured in terms of only the monetary returns, by pointing out that 'K-Electric should stop making money by applying dirty tactics ...the company's refusal to implement the reduced tariff rates as approved and announced by the prime minister was totally unjustifiable and reflected how much K-Electric was concerned about the wellbeing of its customers' (The Nation, 2014: na).

6.5.3 Dissatisfied Customers of K-Electric

At the same time, when the achievements and leadership-skills of K-Electric's management were being lauded internationally, overcharging of customers became a major concern for the citizens of Karachi (The Express Tribune, 2015: b). Even NEPRA warned the company's management against applying dirty business tactics such as excessive billing, issuing unjustified detection bills, performing unscheduled blackouts, overcharging the customers for the fuel cost that was actually much lower, and putting hidden charges in the bills of the customers (NEPRA's Interim Report, 2012).

As we shall see through the response of the customers and the secondary data sources, the government started pulling out of all the subsidies being provided to the company. K-Electric started to target its consumers by constantly increasing the per-unit energy price and VAT to make up for the cost of subsidies (The Express Tribune, 2015). This post-privatisation yearly tariff structure of the company is already discussed in detail in the thesis.

The customers, largely disappointed by the new policies of K-Electric, all of which were focused on increasing the cost to the public, held many protest rallies where the people came out on the streets and demanded that the GOP reconsider its decision to privatise K-Electric (Abbasi, 2011). More recently, in July 2014, the citizens of Karachi staged a protest against K-Electric's non responsiveness towards the issue of wrong billing. The customers even warned K-Electric that they would stage a sit-in in front of K-Electric's head office against the increasing electricity charges (Pakistan Today, 2014). The customers, used to paying less during the nationalisation phase of the company, were not at all happy with the privatisation and criticised the company. One respondent told me:

“After the privatisation, the per-unit cost of electricity has been continuously going up. We are facing 12 to 14 hours of blackouts combined with extremely low voltage², and even after that we are receiving bills in the thousands every month; I can guarantee that I am not consuming the amount of electricity that I am being charged for.” (15th March, 2015).

As per the interview data, the majority of customers were less concerned about how the company was being run, i.e. through private ownership or by the government; their only demand was fairness in the price they were being charged and the quality of the service being provided to them.

Disappointment with K-Electric's working norms was expressed by the consumers using different media, which included registering complaints on the company's official social networking sites (twitter and facebook), establishing many blogs to share their concerns and problems (Yaqoob, 2014), reporting their problems on the government's official online complaints board, holding protests against the company's policies and operations, and filing a number of cases against K-Electric officials at NEPRA. A newspaper article, while criticising K-Electric, expressed the view that 'K-Electric's dismal performance in Karachi is something on which a whole book can be written. They have amassed billions of dollars [as profit] in the last few years while failing to provide a satisfactory service' (Rehman, 2015: na). The critics maintained that K-Electric was making living conditions excruciatingly unbearable for its consumers. Sabih (2015) portrays/depicts the frustration of K-Electric's customers by quoting routine scenarios from their daily lives. He asserts that 'a man comes home tired after work just to find out his family is suffering due to power outages; an elderly, retired gentleman who simply wishes for a working fan so that he could sleep peacefully; a housewife who merely wants to enjoy a few television shows once her day is over; and a student who wants to score well in an exam the next morning' (Sabih, 2015: na).

6.5.4 Customer Service Centres: Trouble Shooters or Trouble Makers

K-Electric's elevated profits, negligence towards the customers' issues, and poor quality of customer service attracted severe media criticism and higher customer dissatisfaction (Abbasi, 2011). The negative impact of K-Electric's performance was visible from the customers' response.

During the interviews, I asked the customers whether they felt any improvement in the services being provided at the newly opened IBCs after the privatisation, and a customer responded:

"They have decorated and rebuilt their offices to a very high standard, and that's the only difference I can feel". (13th March, 2015)

Some of my main concerns during the data collection were to know what the procedure to record a complaint at the customer care centre was, whether the procedure was being followed, and how satisfied the customers were with the complaint-handling staff. A customer told me the process in detail:

“When K-Electric opened up the IBCs, initially their customer care centre was maintaining transparency at least in terms of recording complaints. As per the official procedure, we turn up at the complaint handling centre or call the complaints department, they take our personal details and put it in their system, and issue us with the complaint reference number. This reference number can then be tracked down, even online, and shows the progress in the case so far. Once they realised that issuing a reference number for each complaint created a record of the number of complaints made against the company and how many of them actually got resolved, they stopped giving the complaint reference number, since they hardly resolve any query. They recently told me that my complaint was noted and they would work on it; but, they did not give me any reference number.” (26th February, 2015)

A few other respondents repeated exactly the same story when asked about the procedure of making complaints and how fair the system was. A respondent even added:

“Now they are not even issuing the complaint number to us, which makes it obvious that they are not recording our complaints any more so that they can save face, which is otherwise exposed by the record number of unsolved complaints and proves their in-efficiency.” (23rd March, 2015)

I also tried to investigate whether the implementation of the new technology was benefiting the consumers, and if they were able to get their bills rectified easily now. The customers’ response was a 100% no, as all 40 interviewees responded that they had never got a corrected bill after launching the complaint.

A dissatisfied customer shared the following:

“Well, if you ask me for the difference in K-Electric before and after privatisation, the new complaint handling department staff are well behaved, but we don’t want them to

just be polite, as they do nothing to resolve our complaint; after privatisation, they have hired clever people who are trained to use double billing techniques to make money out of us”. (26th February, 2015)

Another respondent shared his experience:

“I have complained many times that my bill does not reflect the actual amount of electricity that I consume each month, we are billed on the basis of the average reading that is taken in the season, i.e. summer, when the demand is at its peak or the electricity consumption is at its highest; my complaint was never resolved; instead, I was told to pay the entire amount, or they said they would cut off my electricity supply permanently”. (11th March, 2015)

One customer responded:

“I am a simple person, I don’t know about the new system [SAP] and the improvements that you are talking about; all I can tell in simple words is their [K-Electric’s] complaint-handling contact number remains busy most of the time; if you are lucky enough to get hold of someone, they will hang up on you if they can’t resolve your complaint.” (15th March, 2015)

Another disappointed customer while sharing his experience criticised the use of the technology by the company:

“You say they are using modern technology, but to tell you my story, I paid my bill in full, including the late payment surcharge, 2 days after the due date. In the next month’s bill, I was charged double, as the bill included arrears from the last month. I went to the IBC customer complaint centre, took my old bill with me and showed them that I had already paid my bill, hence I should be issued a new bill with payment due for this month only. I was told that they could not print another bill after the bill had been issued to the customer. Can you please tell me which type of advanced technology this is, using which even a bill cannot be re-printed to allow rightful modification?.” (8th March, 2015)

The data made it obvious that the condition of the IBC customer service centres was no different than the endemic problem of load shedding, and the situation was worsening instead of improving (Sabih, 2015). As a general practice, the customers have been kept waiting for months without any response to their queries (Sabih, 2015).

6.6 Conclusion

This chapter discusses that the case of K-Electric is no different to other organisations that have succumbed to the proclaimed benefits of technology, except for the fact that the extensive level to which technological change was implemented at various levels within the organisation was not completely due to the recognition of the need for technology, but was based on their motivation to earn profit on the initial investment.

This chapter concludes that there was a lack of the alignment in the interests of the two major stakeholders of K-Electric, i.e. its management and the customers. The implementation of the SAP system was influenced predominantly by the company's desire to make significant profits, and the technology was being used to penalise the customers and to fulfill the company's motives. It was also noticed that K-Electric's claims about successfully operating the company were entirely based on single component 'profits shown on the balance sheet'. This finding leads to the question of whether the company was measuring its performance solely based on its financial returns. On the other hand, this chapter unveils and thus provides useful insight into the increased dissatisfaction of customers with the company and its business practices (Sarhandi, 2014). Most importantly, this chapter deals with exploring the weak position of NEPRA (in the power system of Karachi) as the main cause behind the empowered role of K-Electric, using which the company kept practicing its unfair means.

Chapter 7: Discussion

7.1 Introduction

Over the last decade, researchers have called for the utilisation of concepts of critical realism in the study socio-material phenomenon (Mutch, 2010; Wynn & William, 2012). In this work, we have argued that the response to these calls has been slow and limited (Volkoff & Strong, 2013; Strong et al., 2014; Bygstad et al., 2016). We stress that the use of CR tradition for the underpinning of socio-material phenomenon is a relatively new approach, where Volkoff et al.'s (2007) work claims to be the first such attempt. The field contribution, especially that of Volkoff, Strong and colleagues, has attempted to fill this void by stressing two points; firstly they highlight that within IS literature, generative mechanisms have great analytical value for underpinning the interplay of social and material. Secondly, they argue 'that the concept of affordances [as applied in the most recent studies of social and material] helps us specify those mechanisms in a easy way' (Volkoff & Strong, 2013, p.819).

This study has attempted to advance this research, firstly, by arguing that researchers within the socio-material domain have by and large focused on the impact of IT enabled change within an organisational context. Through our case, we have highlighted that the impact of organisational technologies goes beyond organisational boundaries and should be presented as such within existing literature. This needs to start by redefining the 'IT enabled organisational change' paradox to the more general 'IT enabled change'. In short, the current socio-material theorisation should include non-organisational actors and societal structures in the analysis to allow for a wider focus. Through the case discussion of K-Electric, whose post privatisation performance was linked with the implementation of SAP technology and highly applauded for turning profit on a classic loss-making enterprise, we have attempted to empirically illustrate this gap. In this thesis, we have argued that these claims only provide a partial account of the reality, as they are based around study of the organisation and technology. We propose the inclusion of non-organisational actors – specifically consumers - in the analysis of impact of organisational technologies. In the methodology chapter we have already elaborated on the non-organisational actor's association with the organisation's use of technology, and highlighted how such association is an integral part of the interrelationship.

In this chapter we will re-engage with the literature to highlight the existing gaps and our potential contribution to the field. This will be followed by a discussion of how we have used the concept of affordances and generative mechanisms in our study. Throughout the chapter, the argument will focus on how the concept of affordances has been extended to support the findings of our case.

7.2 Engagement with Existing Literature

From the literature review it was noted that Mutch's socio-material approach (2002, 2005, 2008, 2010 & 2013) based on CR footings proposed a non-deterministic study of the relationship between structure and agency (both social and material). His approach was therefore seen as an appropriate means to study the organisation, technology and society. However, it was also observed that most of Mutch's writings focus on theory building and do not contribute empirically to the field. Additionally, although he emphasised both the importance of context and materiality of technology in understanding IT enabled change, he did not elaborate (even theoretically) on how this comprehensive model/framework could be applied to other studies. This work attempts to fill this void by capitalising on the concept of affordances of IT and the wider context, both empirically and theoretically.

We would like to clarify at the outset of this section that the purpose of revisiting the discussion on 'affordances' here is not to reintroduce the concept, as we have done this already in the review of the literature. In this section, we will outline the most significant studies along with their specific contributions to the field of 'socio-materiality'. The decision to use the concept of affordances to help extract mechanisms that could explain the socio-material phenomenon as presented in this study required the researcher to locate gaps in the existing literature. Resultantly, the researcher looked at some of the major contributions within the field of IS and IT affordances. It was noted that the IS researchers mainly borrowed the concept of affordances from two prominent bodies of work: Gibson (1986), and Norman (1999). Gibson focused on action possibilities provided by an object to the actor that can be either enabling or constraining depending on the context. For Gibson, the actor's assumptions about an object's potential to provide an opportunity or constraint prior to their use of it is more important than the object's material properties. He viewed the assumptions of actors regarding the potential utility of an artefact not as a logical and calculated decision based on an object's

characteristics, but holistically, as opportunities the actors perceive when they encounter it. Norman's perspective, on the other hand, argued that affordances do not change in use case scenarios. In other words, affordances of an artefact would be the same in all contexts, but their differential usage in varying context stems from the actor's perception (perceived affordances). Recognising the importance of these classic studies, the author began searching for more recent work that capitalised on the concept of affordances within the IS literature. In Table 7.1, the author has classified the field contribution of various studies that are based on concept of affordances, as borrowed from Gibson and Norman. We argue that classifying these studies helped us clearly locate our field contribution. Hutchby's (2001) work, one of the most referred in the IS field, draws on the concept presented by Gibson, but proposes a mid-range 'relational theory of affordances'. For him, affordances are neither characteristics of actors or technological tools, but the product of interactional process through which an actor and technological artefacts come together. Hence, Hutchby emphasised relationships and stressed that affordances of IT objects would indeed alter when actualised in different contextual settings. What does not change here are the material features of the object. Fayard and Week's (2007) work based on the same 'relational affordances' concept highlights how informal interactions within the workplace provide social affordances that are capable of changing organisational outcomes. They base their study on the observation of informal interaction that took place in the photocopying space of three organisations, and how these interactions changed the organisational processes. They conclude that, since the affordances were relational (outcome of the relationship between an actor's ability and IT object's properties), they can be used in multiple ways and can impact the work processes differently. Markus and Silver (2008) present IT-associated affordances as 'functional', and describe them as 'the possibilities for goal-oriented action afforded to specific user groups by technical objects' (p.622). Markus and Silver's work, albeit being a major step forward towards theory building, does not contribute empirically by focusing on any specific technology or organisation. Leonardi's (2011) work uses the 'imbrication metaphor' to outline the perceived contextual affordances. His baseline argument is that, since within contemporary organisations the arrangement of work processes (routines) and technologies are highly adaptable, i.e. subject to change, organisational actors have agency over this change. According to him, within a given context, people would be willing to modify or re-invent technologies if they constrain their desired goals, or to change their work arrangement if they perceive that technology would enable them to achieve their desired outcomes. Strong et al. (2014) present the 'affordance actualisation lens' that shifts the focus of IT enabled change from what changes are afforded by the human and technology interaction towards how these changing affordances

are actualised at the individual, group and organisational level. Volkoff and Strong (2013) than capitalise on CR philosophy and the concept of affordances by presenting their similarities and outlining the possible utilities of combining them to explain IT enabled change. This CR/affordances concept is elaborated on in Bygstad et al.'s (2016) paper, which argues that CR researchers are mostly wedded to the retroduction method, as there is no better available alternative to help identify the mechanisms. In response to filling this void, they show how affordances provide a better means to identify and retroduce mechanisms from a socio-material phenomenon.

Table 7.1 Major Field Contributions within IS and Affordances Literature

Socio-material Approaches	Concept of Affordances	Context	Contribution
Hutchby (2001)	Relational affordances – both enabling and constraining	Organisational context	Theoretical
Fayard & Weeks (2007)	Social affordances/informal interactions	Organisational context	Empirical Theoretical
Markus & Silver (2008)	Functional affordances	Organisational context	Theoretical
Leonardi (2011)	Perceived affordances as ‘imbrications’ of human and material agency	Organisational context	Empirical Theoretical
Volkoff & Strong (2013)	Affordances and CR to explain IT enabled change	Organisational context	Empirical Theoretical
Strong et al (2014)	Affordance actualization lens	Organisational context	Empirical Theoretical
Bygstad et al (2016)	Affordances as analytical tools to identify mechanisms	Organisational context	Empirical Methodological

Source: Prepared by the author

7.3 Contribution to The Literature

Once the analysis of our field data was complete, we created a list of affordances. Following this, we started to compare our identified affordances with those already discussed in the literature. In doing so, we discovered that our field data reflected both commonalities and differences from the present theorisation of the concept of affordances. For instance, affordances and organisational context, affordances resulting in differential outcomes within the same organisation (Fayard & Weeks, 2007; Volkoff & Strong, 2013), and affordances as relational and thereby simultaneously enabling and restricting (Hutchby, 2001) were all in line with the existing literature. On the other hand, several affordances as retroduced from our data were not documented in the literature. For example, we found that our field data covered the non-organisational context that was not included in the discussion of affordances. We identified that our data also focused on the interaction of objects and actors that took place outside the organisational boundaries and provided affordances to non-organisational actors also. Hence, within our case study, the affordances were identified as action possibilities that existed for both organisational and non-organisational actors. Following the relational view (Markus and Silver, 2008) that suggests the affordances are action possibilities made available by technological artefacts to the goal directed actors, we retroduced that even non-organisational actors used the technological artefacts with a specific goal in mind. Within our case, consumer access to the CRM component to launch an online complaint and monitor its progress, access e-billing methods, and access nearby poles and transformers for purposes of electricity theft and manual slowing of the meter, were all seen as action possibilities available to goal directed actors. Furthermore, these action possibilities were made available to non-organisational actors (consumers) through the use of various functions of SAP components. In Table 7.2 we build on the 7 main components of the SAP system as outlined in the methodology chapter: electricity supply function, meter reading, billing, maintenance, payments (both in person and mobile), CRM, and the smart grid technology function. It is important to mention here that these affordances were identified apart from the basic affordances that any ERP provides, i.e. centralised data storage, management, and cross departmental access to related information. In the methodology chapter we briefly outlined the main components of the SAP system and highlighted their association with both organisational and non-organisational actors. Through Table 7.2 we would now look at action possibilities that various components of SAP provided to both organisational and non-organisational actors to assist in achieving their related goals.

Table 7.2 Affordances Provided by SAP Technology to Organisational and Non-organisational Actors

	Components of SAP	Affordances for organisational actors	Affordances for non-organisational actors
1	Electricity supply control function	Enabled the staff to switch off the power supply of any region at any time.	-----
2	Meter-reading component	Allowed staff to record the units consumed during a billing period.	Provided the opportunity for consumers to dislocate a ‘null device’ from the meter, thereby slowing it down and reducing the units consumed during a billing period. Action possibility of bribing the meter readers to falsify a low meter reading.
3	Billing component	Enabled K-Electric to create wide billing brackets to penalise middle and low-income groups. Opportunity to include unconsumed units in consumer bills. Inclusion of various facility charges in the bill.	Provided consumers with the option to steal electricity and impact the bill. Commercial and residential consumer’s refusal to pay the bill.
4	Maintenance component	Automatically notified employees of scheduled maintenance. Alerted staff about power plants that required unscheduled updates. Updated employees on equipment that needed replacement.	-----
5	Payment component	Provided access for employees to update consumers’ billing records once the payment had been received online or over the counter.	Provided options such as e-billing and mobile payment methods to receive, check and pay bills online.
6	CRM component	Allowed the input and tracking of customer complaints on the system. Forwarding complaints to the related department i.e., billing, connections etc.	Allowed the launching of complaints and the ability to track the progress of an application online. Request new connection, updating customer records such as change of address on the system. Contact call centre staff to get information/updates on any issue.
7	Smart-grid component	Facilitated replacement of manual meter reading with an automated process Helped in more accurately identifying electricity theft.	

Source: Produced by the Author

From the literature, we know that since technologies offer multiple functionalities, they can produce diverse results (depending on the intention or goal of the actors using the technologies) within organisations (Gibson, 1986). However, the affordances literature does not outline how these affordances provided by the IT artefacts are used to produce differential outcomes outside the organisational boundaries. Within our case study, affordances provided by the SAP technology were being used to perform the differential treatment of society as contributed by favourable contextual conditions. These new types of affordances observed in our data suggested how the researchers can build around the affordances and mechanisms to address the gaps in the current socio-material theorisation. Resultantly, even when we discuss the set of affordances already present in the literature, such as standardisation versus customisation (Leonardi, 2011), affordances as enabling and constraining (Hutchby, 2001), affordances as contextual conditions (Gibson, 1986), and affordances producing differential outcomes of the same technology (Volkoff & Strong, 2013), we present them from a different perspective. Our discussion of each set of affordances focuses on how they contributed to producing differential outcomes involving SAP technology and society. Since looking at the differential outcome of SAP technology on various societal (upper, middle and low income) groups is one of the main contributions of this study, we will return to this discussion in a later section of the chapter and outline the different IT affordances observed from our data.

7.4 Role Relationships and Structural Associations

Once the review of literature was complete, we discovered that almost all the main contributions within our proposed area focused on organisational context (refer to Table 7.1). Resultantly, theories of IT associated change generally engaged with the discussion of role relationships within an organisational context. Most of these studies emphasised how traditional role relationships have evolved in the process of implementation of technological forms to support business operations. The work of several authors, particularly Leonardi (2011), has provided great insights in to the way work processes have changed as a result of the implementation of technological systems within organisations and how these processes have altered the role of relationships. These approaches have equipped us with the understanding

that, in a technology supported work environment (new work processes), actors have both pre-determined action and the ability to pursue these goals through the technological artefacts. However – despite being goal directed – since the actor’s activity is situated within an organisational context, their goals reflect organisational goals (Strong et al., 2014). Hence, it is safe to assume that although technologies offer affordances to achieve multiple goals (i.e. individual, group and organisational), the process of actualising these affordances is impacted by the role of relationships embedded within organisational structures. In short, although technologies provide multiple means for an actor to work with them (Fayard & Weeks, 2007), role relationships ensure that organisational actors use the technological artefacts to achieve organisational goals.

While we appreciate that present affordances based literature acknowledges the role of relationships and their impact on the organisational use of technology, arguably, its main shortcoming is the non-recognition of role relationships that exist outside organisational boundaries. We argue that these external role relationships and their association with organisation simultaneously provide opportunities and place constraints on the organisational use of technology. The current theorisation of affordances presents the process by which affordances of an IT artefact are actualised by the organisational actors as fairly simplistic and free of external influences. The concept of affordances in its present form does not allow researchers to locate, understand, or include various role relationships, associations and structural interdependencies that exist outside the organisational boundaries. Although Strong et al.’s (2014) work builds on the multiple and interdependent affordances of EHR technology and presents them through the dependency diagram, in doing so it focuses solely on the organisational context. This work implies that these role relationships and interdependencies do exist externally, but have the tendency to impact the actualisation process of IT related affordances. Furthermore, we argue that these external networks of association would vary depending on the economic context in which the IT enabled change is taking place. These associations and interdependencies would produce vastly different outcomes in emerging economies as compared to developed countries due to variances in the economic and governing mechanisms. We have attempted to show this through institutional practices and interdependency networks in our discussion of Pakistan’s econo-political context to highlight the structural differences that exist between emerging and developing economies (refer to Chapter 4 for detailed commentary on this).

Our field data, once again, both complemented and extended the concept of role relationships as presented in the IS literature. Firstly, as highlighted in the context building chapter, we identified that the implementation of SAP technology resulted in new forms of communication (via-email), a changed reporting structure, and an updated process of information storage and access. On the other hand, K-Electric's association with external entities indirectly shaped the company's usage of the SAP system. Within our case study, the highly contested yet easily actualised affordances of SAP resulted not just from the willingness of goal directed actors (management) to achieve the immediate concrete outcome of profit maximisation, but also from the systematic interdependencies that existed between the power regulating and governing institutes. Through our case we imply that this interdependent network then resulted in fewer social constraints being applied to K-Electric's use of technology. We have tried to clarify and outline this network of association in Figure 4.1 of Chapter 4. From the field data, it was noted that the three main entities of our case: the government, NEPRA, and K-Electric, were interdependent to the degree that their activities actually enabled them to apply greater influence on each other's practices. For example, the very fact that many of the government institutions themselves were K-Electric's defaulter (owed K-Electric billions of rupees in payment), impacted and influenced the power of the Pakistani government to restrict K-Electric's unethical business practices. Resultantly, in the presence of fewer governmental constraints, K-Electric was able to use various components of SAP technology to penalise middle and low-income consumer groups. Similar interdependencies were observed in the relationship of the government and NEPRA. The regulator obtained funding from governmental institutions to support its initial operations, which resulted in its establishment as an independent and autonomous unit being compromised. NEPRA's weaker position in the power structure also minimised the social constraints that would have otherwise been in place to control K-Electric's unlawful use of SAP technology. This was evident in the actions of NEPRA in its approval of the continuous increase in consumer tariff rates despite initial resistance to it, as the charges were approved by the government itself. It was also noted from the field data that NEPRA attempted to implement further constraints on K-Electric's activity by imposing penalties. However, these penalties never translated into practice, as K-Electric always obtained a stay order from the government.

While documenting these external social affordances and understanding how they facilitated K-Electric's use of IT related affordances, we realised that the current socio-material theories have overlooked this aspect of analysis. Consequently, two main gaps were identified here; firstly, researchers have not elaborated on the role of relationships and association of organisations with other institutions that govern its practices, including its use of technological forms. Secondly, most of the studies used to support and extend the concept of affordances were developed in a westernised context. It is argued that these western approaches do not provide the required utility for understanding the role of relationships and power practices that exist in the emerging economies and thus shape outcomes triggered by IT artefacts. This work implies that in emerging economies, powerful institutions and their activities are interconnected, and this can result in IT artefacts being easily used to penalise specific and seemingly powerless groups of society.

7.5 Importance of Context Surrounding the Organisational Use of Technology

Our classification of socio-material theories along with their field contribution (Table 7.1) revealed that researchers have not sufficiently engaged with the discussion of wider context in their analysis. The mere mention of wider context in the studies of IT enabled change remains highly discursive/theoretical and is not spelled out clearly. We argue that discussion of the broader economic context sets up the background that is crucial to understanding any socio-material phenomenon (refer to the literature chapter for details).

This work implies that the detailed description of context on a wider econo-political level helped us better understand the background of the privatisation of K-Electric and its rolling out of the SAP Utility System as a result of the recent wave of privatisation in Pakistan enforced by international institutions such as the IMF and the World Bank. Additionally, understanding the role of the regulator (NEPRA, that was embedded in the context) and its relationship/interaction with K-Electric has greatly aided this research in understanding and uncovering various affordances availed by K-Electric's management (organisational actors empowered by the power vested in them through structural setting) that wouldn't have been eas-

ily achieved if triggered in a different context (i.e., if NEPRA had more power and control over the utility).

The study of context surrounding K-Electric has also helped the researcher in uncovering the societal aspect which contributes more than simply setting a backdrop for the case study. The social structure of society as divided into different groups enabled us to look at different role relationships between K-Electric as an organisation and its varied customer base. In particular, we looked at how the affordances of different functions of the SAP system allowed K-Electric to exercise power by charging extortionate fees and carrying out unannounced black-outs at their discretion while simultaneously placing a barrier/constraint on illegal electricity theft by its customers. This contextual underpinning also helped the researcher in uncovering various causes (mechanisms) that led to the use of the SAP function for overbilling. For instance, while it is easy to comprehend at the empirical level that K-Electric's implementation of SAP was correlated with company profits, there may be variety of factors that made it possible for the utility to increase profits. These include top management's desire to recover costs and further profit by misusing the SAP technology and its various functions, the improved employee performance in the post implementation period, or employees' positive experiences with the SAP system.

Since our decision to use the concept of affordances was influenced by our desire to locate mechanisms easily, we now turn our discussion towards the application and utility of the CR approach in this study.

7.6 CR and Socio-materiality

This thesis utilises the three main aspects of CR philosophy: stratification, emergence, and generative mechanisms for analysing the polarised views on K-Electric's performance in its post SAP period. The concept of stratification calls for decomposition of events with the objective of uncovering generative mechanisms operating at the level of real, actual and empirical that enables researchers to develop more accurate descriptions of the reality. We used the concept of stratification to retroduce both affordances and their underlying mechanisms from

the empirical events. Following the stratification, many mechanisms were identified that explained both IT enabled and contextual change. We will continue with the detailed discussion of the identified affordances and mechanisms in the next section.

CR philosophy's recognition of both structures and agency and the observance of their relationship over time in a non-deterministic way helped this study to identify that, although the organisational structure and situated powers enabled the actors in charge of using SAP system to penalise customers using the billing component and electricity control function, this does not imply that customers situated outside of organisational structures did not have agency. Customers responded with public protests, complaints, conflicts with K-Electric's staff, electricity theft, and refusal to pay penalties imposed on them.

The concept of emergence also enabled the researcher to look at the uses of SAP components by the employees as instructed by the top management and modified by the in-house IT staff. For instance, we argue that although the SAP technology did provide affordance to the IT people to create separate tax brackets for people consuming between 300 to 350 units and those consuming up to 700 units, this affordance was not actualised, as 75% of the city's population consumed between 300-700 units. Hence, the best way for K-Electric to maximise its profits was to create wider tax brackets in the system that would charge the same tariff and VAT to all those consuming between 300-700 units. Hence, the emergent use of technology to auto-generate the bills using these tax brackets allowed the company to profit by penalising the middle and low-income groups.

Another example of the emergent use of technology was seen in the way automation of the grid function was achieved by the management. Although, it can be argued that SAP provided the action possibility to K-Electric to utilise the maximum capacity of its power plants to ensure uninterrupted power supply. However, the automation function was modified to switch off the grid automatically if the power demand was increased, to avoid high maintenance cost.

7.7 Generative Mechanisms, Affordances, and The Inclusion of Non-organisational Actor

One of the significant contributions made by this study is the inclusion of non-organisational actors in the socio-material theorising by capitalising on the concept of affordances and generative mechanisms. Although we know that affordances focus on interrelationship of the actor and object (that they come in to contact with) and the set of possibilities that such interaction would generate, within the social and material domain, studies have focused solely on the interplay of organisational actors (both management and employees) and IT objects, thereby ignoring the non-organisational actors (society, specifically customers). This void becomes even more apparent with the advent of new technologies such as specific group wares that provide user interface and open new avenues of opportunity for the customers to directly use the organisational technologies for various reasons (applying for jobs posted on company websites, online shopping, registering complaints, making online payments and interacting with organisational staff through the e-chat service). In such cases, since the non-organisational actor also comes in to contact with the technology, the IT enabled change should consider this interplay when documenting the affordances that arise from the interplay of IT objects and actors. Bygstad et al.'s (2016) work abortively touches upon this in their study of Aircorp's development of an IT interface system that will replace airline agents. Using this interface technology, customers can book and pay for tickets directly (online) from Aircorp, thus removing the role of travel agents from the process. However, the main focus remains organisation and technology, as the findings of their study dismiss the influence of the market mechanism of related customer demand on the implementation of IT.

Secondly, since we know that affordances can only explain the direct interaction taking place between object and actor, we can use the broader concept of generative mechanisms to help identify the impact of technologies on non-organisational actors when there has been no direct interaction. For example, in the case of utility providing companies generally - and K-Electric specifically - service elements such as uninterrupted power supply, timely maintenance of power plants to ensure continuous supply, compilation of transparent and clearly understood consumer bills, and the company's response to consumer issues (complaints, que-

ries), will all have a direct impact on consumers, even when there is no direct interaction between consumers and technology or consumers and organisational actors. Hence, from the above description it is safe to assume that the ways in which organisational actors will use technologies (to achieve organisational goals) will have a direct impact on the non-organisational actors (consumers).

Thirdly, generative mechanisms develop better causal insights than affordances, even when technological objects are not involved. We have already reproduced the three generative mechanisms of strategic innovation (service, and control) (refer to Chapter 3, Table 3.6) from the interaction of IT objects and actors. However, we argue that apart from the above-mentioned mechanisms, economic and governance mechanisms also provide explanatory power for the occurrence of various events within our case. For instance, in this study, both economic and governance mechanisms can be thought of as stimulating or enabling contextual conditions. For example, the economic mechanism which triggered the privatisation that was enabled by the weaker economic-political position of Pakistan and its over reliance on the structural loan provided by the IMF and World Bank. Similarly, the lack of proper governance/accountability mechanism was perceived to have strengthened the unethical business conduct of K-Electric as observed at the empirical level.

In the next section we will discuss various IT related affordances identified from our field data and outline how these affordances can be used for the underpinning of various aspects of socio-material change.

7.8 Affordances (capabilities) Provided by SAP Technology

Unlike custom built programs/software that are limited in their impact, enterprise systems such as SAP have widespread effects on the entirety of an organisation and its operations, and as such are considered to be an appropriate means of exploring the relationship between technology and organisation (Volkoff et al., 2007; p.833). The implementation of SAP technology within K-electric can be understood as a result of the relationship between the needs of organisational actors (K-Electric's management) and the capability provided by the SAP system. The concept of affordance helps in understanding that, although human actors have will and predetermined goals (earning profit in the case of K-Electric) in mind, they lack the capability to accomplish these goals. Technology on the other hand has no will of its own, but possesses the properties to accomplish what human actors cannot (Bygstad et al., 2016; p.88). For example, in the case of K-Electric, implementation of the SAP system can be seen as the result of an innovation mechanism that was enabled/triggered by strategic organisational planning. SAP technology was preferred to other forms as it had several material properties that enabled K-Electric to achieve its desired goals. We reproduced from the main findings (refer to the methodology chapter for details) that the concept of SAP technology was pilot tested and later rolled out in all IBCs as it helped to facilitate greater control over processes; generating revenues and controlling losses. One of the main reasons behind the implementation of SAP technology was its compatibility with other technological systems such as smart-grid technology. These additional technological systems (smart-grid technology) were once again considered useful in achieving the organisation's desired targets of controlling electricity theft.

7.8.1 Customisation versus Standardisation Affordances of SAP

One of the main features of the SAP system is its ability to provide management with the opportunity (affordance) to either customise or standardise various components, depending on what the organisation wants to achieve and under which conditions. We know from the literature that the interaction of technology and actors (employees) will produce differential outcomes based on the ways in which individuals or group users apply the technology (Volkoff & Strong, 2013).

From the field data it was also observed that where the managers of different business units of K-Electric were able to achieve standardisation affordance, the resulting outcomes were the same. For instance, the SAP system's billing component was being used in a standard format across all business units to add additional units and facility charges to customer bills, irrespective of their position in the societal status quo. Since the practice of including additional units (for profit maximisation) in consumer bills was standardised across all the business units of K-Electric, customers reacted with resentment, as their ability to have their bill modified/corrected was constrained by K-Electric's unwillingness to allow for such amendment.

Contrary to this, the electricity control function was customised to perform blackouts in middle and low-income areas. Different business units (depending on their area of service and operation) used the SAP function to control the electricity supply in their allocated area in a non-standard way, thus leading to the customised use of the electricity control function. Resultantly, customers belonging to different societal groups were impacted differently by the SAP system's billing function. This was useful in understanding how people within high income neighbourhoods were not impacted by unannounced power cuts and were satisfied with K-Electric's operations. On the other hand, consumer groups that constituted the lower class were penalised and experienced severe power cuts that resulted in their growing resentment towards the utility. We have outlined the process of organisational usage of various components of the SAP system that were either standardised or customised in Table 7.3.

The case study also highlights that the response time to rectifying faults in electricity pipelines resulting in power cut-offs varied for different business units. For instance, if the power supply of an IBC operating in lower class areas was affected, K-electric's engineers and technicians would take anywhere between 24 hours to three days to restore the power supply. The course of action was different if similar power disruptions were experienced by upper level societal groups, where the power supply would be reinstated within hours.

Table 7.3 Standardisation versus Customisation of SAP Technology Functions as Adopted by K-Electric

Standardisation affordances of SAP System's Function	SAP's Function	Customised affordances of SAP's function
Standardised for all societal groups	Billing Function (Billing corrections) (Adding extra units)	-----
-----	Maintenance Function	Differential handling of customer complaints, restoration of electricity supply depending on their position in the social status quo
Standardised for all societal groups	Smart-grid Function	-----
Standardised for all societal groups	Mobile payment application Online billing application	-----
-----	Electricity supply control function	Customised depending on location and area of service covered by the IBC division

Source: Prepared by the author

7.8.2 Affordances as Enabling and Constraining Forces

Most recent studies within the socio-material domain have presented 'affordances as only enabling, but affordances are inherently both enabling and constraining simultaneously' (Volkoff & Strong, 2013; p. 831). Through this case we have also illustrated how the same components of SAP technology provided affordances (capabilities) to the management and employees (organisational actors) and simultaneously restricted consumers' (non-organisational actors) ability to act, and in some observed events, vice versa. For example, organisational misconduct through overbilling, blackouts, and poor maintenance of power plants were all afforded (facilitated) by organisational access to these SAP components and

the consumers' lack thereof. On the other hand, consumers used the affordance of stealing electricity, as the power supply system was built above ground and allowed easy access for consumers to directly connect supply wires. An image showing the illegal connections, connected to a single power supply pole, is presented in Figure 7.1 to help readers visualise the practice of electricity theft. The company's ability to stop such actions was restricted due to the system being exposed and the aggression of the local community, who would threaten and sometimes fight with the staff sent to remove the illegal connections.

Figure 7.1 The Network of Illegal Connections



Source: Photographed by Ajemri, R. Reproduced from Tribune, 2017

The application of the concept of affordance also helped in identifying 'constraints that arise from the absence of a desired affordance' (Volkoff & Strong, 2013; p. 831). For instance, from the case study of K-Electric, one might reproduce that the SAP system (an action possibility = affordance) lacked a facility that would allow K-Electric employees to modify and issue new bills. Since there can be 'incomplete or inappropriate actualization of affordances', one can also reproduce that the affordance may exist and have the potential to provide advan-

tages, but those advantages may not be realised. In fact, the affordances may not even be perceived despite their availability. Unwillingness to change behaviour or an insufficient level of skill or knowledge may also impede actualisation' (Volkoff & Strong, 2013; p.831). Hence, it can be argued that the functionality to rectify a bill may exist, but the failure to actualise it could be due to employees either being unaware of such function, or lacking the skills required to modify a bill on the SAP system. However, there may be other action possibilities. For example, management could purposefully restrict employee access to such functions to serve their agenda, neglect to provide the minimum training necessary to enable employees to use the billing component of the SAP system correctly, or completely block employee access to any such function.

7.8.3 Affordance Lens: Underpinning Differential Outcomes of Similar Technologies

Another main contribution of this work is highlighting how the affordances of technology provide differential action possibilities, thereby leading to the differential impact of similar technologies. Affordances are dependent on user actions, so organisational actors (employee groups, IBCs etc.) may well use the same components of the SAP system to enable or constrain an action depending on what the organisation wants to achieve. This clear understanding of the concept of affordances also provides a great deal of value in understanding how the SAP technology with its identical features generated differential results for individual societal groups. For example, the electricity supply control function enabled employees to initiate blackouts in some neighbourhoods but not others. Applying the broader concept of generative mechanisms enables us to comprehend that the ability to initiate a blackout (control mechanism) would exist at all the business units irrespective of this functionality being exercised/actualised. We then retrodeduced from the case study that a counter 'mechanism of power' available to the residents of high-income neighbourhoods restricted the top management's desire to initiate blackouts in these areas. Hence, despite the affordance of electricity supply control function being available at all the IBC divisions, it was exercised frequently only in areas occupied by middle and low-income members of society. This differential treatment of non-organisational actors (residents of different societal groups) resulted in varying consumer experiences of K-Electric.

Moreover, the affordance of creating wider tax brackets using SAP technology's billing component also represented differential treatment of middle and low-income groups by K-Electric. It was recognised that the company purposefully designed the wider tax brackets in a way that enabled them to charge high tariff rates and additional taxes to low and middle-income groups, as they constituted 70% of the population of the city of Karachi.

An identical pattern of differential treatment was also observed in the use of the maintenance function. From the field data, we retroduded that when the transformers tripped and ceased operation due to rain or system-fault, technical teams would be sent out on priority basis to neighbourhoods occupied by high-income consumer groups to ensure the prompt restoration of the power supply. Once again, applying the concept of generative mechanisms, we can infer that the same quick maintenance was possible for the middle and low-income neighbourhoods, but was not actualised due to managerial preferences. Thus, owing to power of K-Electric and lack thereof by consumers of middle and low-income groups, the company's response time for power restoration took anywhere between 24 to 48 hours, and even up to 96 hours in several instances.

Additionally, we know that the affordance (possibility) of avoiding blackouts would exist if K-Electric's management invested in improving infrastructure and responding to SAP system alerts concerning maintenance of power plants. Once again it was observed that the infrastructure was well maintained in high-income neighbourhoods, yet the maintenance function was minimal to non-existent in areas occupied by middle and low-income people, thus leading to differential outcomes.

Furthermore, we argue that although the mobile billing application provided the affordance to the citizens of Karachi to pay their bill from home, the availability and ease of use of mobile applications would depend on the quality of the internet connection in different areas. Hence, these mobile applications also provided disproportionate benefit to wealthy customers as they has greater access to high-speed, uninterrupted internet.

7.8.4 Affordances as Contextual Conditions

Our study of K-Electric extends and supports the idea that affordances are context based. We support the idea that similar technologies will provide a different set of affordances when deployed in differing contextual settings. We have utilised this context based view of affordances to extend and explain two main findings of this study. Firstly, to describe how SAP technology has varying impacts on different consumer groups. From the case study, we observed how SAP provided affordance to the management (through its material properties to customise the functionality) to treat different groups of society (affluent, middle-income and, low-income) differently. Secondly, this view also helped us understand that the way in which SAP's functions and material features were used by K-Electric (to maximise profits) would not have been easily actualised in other economies with powerful and effective economic, control, and governance mechanisms. This is to say that SAP technology would provide the same affordances to customise and control the electricity supply of different regions/areas to all the organisations around the world using SAP technology. However, the affordance of actualising these functions and the extent to which they are actualised would all depend on the contextual conditions being enabling or restricting. Similarly, we argue that the opportunity (affordance) for differential treatment of consumers as enabled by technology would be difficult to actualise in developing economies where mechanisms of control are active and customers are more aware of their rights.

7.9 Conclusion

This chapter, through its engagement with current socio-material studies that focus on IT affordances (available to the organisations), highlights three basic shortcomings of these approaches. Firstly, it points out that the non-organisational actors have been dislocated from the discussion of IT enabled change. Secondly, it highlights the lack of consideration of role relationships that exist outside organisational boundaries (part of the wider context) but have significant influence on organisational practices. Lastly, it identifies the gap in current theorisation to account for the differential impacts created by the organisational use of technology on individual societal groups. Through the identification and discussion of these gaps, we highlighted, both theoretically and empirically, how and why the inclusion of non-organisational actors, societal arrangements and external role relationships is vital to the un-

derstanding of the IT-enabled change process. Our research implies that studies of the organisation and technology will continue to produce partial accounts of reality unless they widen their scope of context to include society and role relationships that exist outside the organisational boundaries.

By utilising the concept of affordances as a subset of the full set of mechanisms (as adopted from Bygstad et al.'s 2016 work), we have outlined a process whereby the researcher can attempt to understand the impact of organisational technologies on society, and vice versa. Our work implies that combining affordances and generative mechanisms provides significant utility to researchers in the IS field to understand the differential outcomes that a technology is capable of producing, both inside and outside organisational boundaries. In our case, this was followed by the identification of potential sources (mechanisms) that existed externally, and provided greater explanatory value to define the institutional power possessed by K-Electric that allowed the company to block the resistance posed by societal groups and continue with its preferred practices.

Chapter 8: Conclusion

8.1 Introduction

In 2014, an article published in the Express Tribune stated, ‘the power utility [K-Electric] has come a long way since it was privatised in 2005. From a company beset by rampant theft, network of rickety power lines and corruption, it has emerged as a benchmark for other electricity suppliers in Pakistan’ (Hasan, 2014: na).

Another article published in 2015 in the Dawn newspaper, asserted ‘K-Electric has used a slick public relations campaign to present itself as something of a miracle worker in lifting the power utility into profitability. But beneath this claim lurk a series of very serious allegations. They include charges of rapacious recoveries levelled by industrialists, allegations by the regulator that the top management at the utility issued instructions to staff to engage in overbilling, and more sinister accusations of gas theft, abortively touched upon by the NAB (National Accountability Bureau) as part of their investigation... It would be premature to conclude that the management’s job is done once the balance sheet shows a profit.’ (Dawn, 2015: na)

The statements presented above provide contrasting accounts of the utility company, K-Electric. While the first statement presents K-Electric as a highly successful private venture that has achieved unexpected profit for a classic loss-making entity, the second statement serves as a factual warrant for readers and researchers alike to re-evaluate many important events before succumbing to the so-called claims of success. It is this dual representation of reality about the utility provider (K-Electric) that the researcher has aimed to explore in this thesis.

This work argues that we can achieve a better understanding of the contested nature of K-Electric’s performance in the post privatisation period if we develop our analysis around the organisation, technology and society nexus. We stress that K-Electric’s differential representation – massive success for some and organisational misconduct for others – stems from the varying experiences of different social groups (namely K-Electric and its customers) in the post SAP implementation period. Since the new management of K-Electric was able to announce profits after 17 years, they actively presented their achievement as a success story. On

the other hand, as the consumers experienced continuous dissatisfaction in the post privatisation period (due to K-Electric's visible misconduct), they became highly sceptical of the utility's business practices. Through this we make our point that, in order to achieve a better understanding of social events, we need a multi-layered theoretical frame work that allows researchers to observe social structures as embedded in the wider context that surrounds both organisations and their choice of technology.

8.2 The Research

Since the post privatisation success of K-Electric was being linked directly to the implementation of SAP technology to revamp its business processes, technology was considered an important aspect of this study. Attention to the technological artefacts then revealed that the recent body of work on organisation and technology has by and large focused on resistance or acceptance towards differential enterprise systems arising from the organisational actor (employees). What has been overlooked in these accounts is the inclusion of non-organisational actors (consumers) situated within the societal structure that an organisation is embedded in. In this thesis we have argued that the scope of the IT enabled change crosses the organisational boundaries and also impacts consumers. Furthermore (particularly in an emerging economy) the impact of this IT enabled change differs depending on the societal group (upper, middle & lower income).

To support our research agenda, we suggested that Alistair Mutch's socio-material theory (2002, 2010 & 2013) can be of great value given its focus on structures and both human and material agency. His approach, although not fully developed and highly theoretical, highlights the importance of the context that surrounds both organisation and technology. Another strength of Mutch's socio-material theory is that, unlike other critical realists, his theory does not overly rely on human agency and focuses on the materiality of technology as well. Furthermore, Mutch's socio-material approach utilises concepts of CR philosophy for the purpose of clarity. During the development of this thesis, it was observed that central tenets of the CR approach, such as stratification, emergence and generative mechanisms, helped in shaping and explaining the outcome of this study greatly. CR's concept of stratification (i.e., real, actual and empirical level) was deemed helpful in identifying the causal mechanisms that lead to the differential impact of similar technologies on different consumer groups. This involved uncovering generative mechanisms operating at the level of real to develop in-

formed theoretical accounts. In order to understand differential outputs produced by similar technologies and differential outcomes experienced by different consumer groups, we looked at material aspects and functionalities of technology, its usage by organisational actors (employees), and the complex relationships with IT, organisations, powerful outside institutions, and societal structures, all as distinctive entities that interact with each other to produce outcomes visible at the empirical level.

Since this work argues that IT, like other elements, possesses materiality and is not completely user dependent. The concept of 'emergence' taken from CR was of great use here as it helped in developing the understanding that, although technology is an outcome of human creation, once put to use, it is not entirely human dependant. The most recent concept of 'affordances of technology' was also deemed useful as it helped understand how technology provided 'action possibilities' (both enabling and constraining) that shaped differential outcomes of similar technologies. Unlike most of the IS literature, which refers to affordance only as enabling and as perceived by humans, we take the position adopted by Volkoff and Strong (2013) that, just like mechanisms, affordances also exist at the real level regardless of whether actualised or not. The functionalities and material properties of IT cannot be completely reduced to the human perception. However, the way in which affordances of technology are actualised would depend on the user's perception because, unlike mechanisms, affordances are user dependent.

This thesis recognises that the concept of affordances of technology has not been extended to include non-organisational actors and their interactions with the technology. Through the case study we highlighted that non-organisational actors are not only interlinked with the organisational use of technology, but also use various components of technology with specific outcomes in mind. Consequently, we argued that the non-organisational actor's role has not been fully developed in the affordances literature and is research dependent, both empirically and theoretically. Additionally, we proposed the presentation of the concept of affordances (as used initially by ecologists) to focus on the context in which an object and actor operates. We believe this will help researchers (looking at organisation and technologies) to provide more comprehensive accounts of IT enabled- organisational and societal change based on logical reasoning.

Empirically, we attempted to fill this void and show the potential for such theory by studying the implementation of the SAP system at K-Electric. The case explored how the utility's management implemented SAP technology to pursue their own interest, how the affordances of technology simultaneously enabled organisational actors to pursue their goals – namely 'profit' – and restricted non-organisational actors (customers) from pursuing their own. This led to varying opinions about the performance of K-Electric in the post SAP implementation period, based on differential customer experiences/encounters with the utility.

8.3 Limitations of This Research Project

Although (as detailed in the methodology chapter) the choice of research site was the best approach possible, keeping in mind the size of the study and the budget allocated for this research project, this thesis has a few limitations worth highlighting.

The first limitation of this study is the time period and the number of informants approached for the development of this thesis. This thesis acknowledges that many of the useful pieces of work, including the writings of Archer (1996 & 1979) that many CR researchers utilise, covers a large span of time of up to 300 years. Archer's work details the process of change in the societies, particularly in the education system, hence the time period covered in Archer's writings is justified. Within the premise of this thesis it is identified that studying change requires a longer time span to observe how practices change in time and space. This study was also focused on narrating the process of change within K-Electric and how that change was embedded in the wider socio-economic context. However, given the time frame of three years allowed for this project, the researcher tried to gather as much information as possible. The use of historical documents provided useful insight into the history of the company and its traditional mode of operation, as opposed to the new ones adopted in the post-privatisation period. However, it is also understood that if the time span of this study would have been little longer, it would have helped in unveiling various causal and generative mechanisms that this study might not have been able to grasp at this stage.

On the other hand, as stated above with K-Electric's case, there were a number of mechanisms operating at deeper level that were uncovered only by detailed inquiry from informants. Hence it was realised that if the time span would have had allowed an increase in the

number of informants, several other important mechanisms may have been uncovered and would have shaped the case study findings in a different way.

Similarly, during the non-participant observation that lasted for two months, several inside connections were made within K-Electric. Meeting up with employees (most of them potential informants) on a daily basis helped in building a relationship of trust, where employees talked more openly about these oppressive mechanisms that were otherwise not visible. Thus it was realised that if this activity lasted for few more months, the researcher would have had time to uncover more mechanisms with the potential of creating conflicting or reproducing patterns of activity.

Additionally, it was recognised that if the researcher had chosen participant observation instead of non-participant observation, then the researcher may have had direct exposure to working on SAP technology, and this would have enabled the researcher to describe the functioning of various components of SAP even more accurately. Not only this, but it would also have facilitated the researcher in establishing firm accounts of how different components of SAP were being misused for personal gain. Furthermore, participant observation would have given the opportunity to mix with other employees of the company, and the level of trust during conversation would have been higher, thus leading to the discovery of various mechanisms operating within deeper levels of social reality.

On a more theoretical front (as stated earlier in this chapter), it was identified that, especially within the context of Asia's emerging economy, there were several other industries facing the same economic and societal context. This was mainly due to greater intervention of macro-economic players in the formulation of state level reforms in the emerging economies due to the dependence of these states on conditional loan facilities. It was therefore realised that if the time period of this research was stretched it would have provided an opportunity to carry out a comparative analysis with 2 or 3 cases available at hand.

Lastly, this research was carried out with a hope that future research within the domains of organisation, society and technology might apply this extended framework of the socio-material approach (as developed in this thesis) in order to more deeply engage with the social and economic dimensions of the study of organisations.

8.4 Future Work

The development and application of socio-economic structures in the socio-material theory provides future researchers with a conceptual tool that facilitates understanding of the role of economic structures (and actors embedded within them) in determining and sometimes shaping organisational choices/decisions. Furthermore, this tool kit enables the researchers to take into account the various social structures of class system and culture, because the organisations are locally deeply embedded within these structures. It is also understood that a major chunk of literature focuses on resistance or acceptance towards different technological forms as applied only from within an organisation. This research suggests that organisations and their preferred technologies are not a part of a closed system, hence they should be studied in relation to the environment surrounding them (Mutch, 2008). It also acknowledges that an organisation's choices and decisions to implement technologies have a direct effect on their customers (that are located outside organisational boundaries) and vice versa.

The second important area for future development comes directly from the application of CR philosophy that helps in exploring the causal mechanisms (both visible and invisible). As the findings of this case study revealed that the accounts of either employee satisfaction or dissatisfaction with organisation's preferred technologies can be manipulated. As was identified in this research, employee satisfaction with SAP technology was obvious at a visible level, but closer inquiry uncovered that employees of K-Electric were alarmed by the bureaucratic method of controlling operations, and preferred not to voice their concerns and dissatisfaction openly, which led to manipulated outcomes of employee satisfaction. Whereas a contrasting example was shared by one of the international development consultants during the exploratory phase of this research, where their consulting firm in Afghanistan's business context tried to implement a computerised system to keep a check and balance on the monetary inflow and outflow, in order to curb the otherwise increasing corruption. The high level officers retaliated, because using the system meant that corruption would no longer be possible. Subsequently, the officers also ordered their subordinates and other staff to resist the technology on the grounds that it was complex and not easy to work on. In this case, the apparent dissatisfaction towards technology stemmed from high officials' hidden motives to pursue corrupt operating practices. It is clear from these narrative accounts that there are always mechanisms operating at various levels of reality, and in order to get an approximation of this objective reality, the researcher should try to uncover as many of these mechanisms as possible.

It is also stressed here that the technology, organisation and society debate, especially in the context of developing economies, provides a promising research site with a lot of potential to explore its different dimensions. As outlined in the methodology chapter of this thesis, the researchers initial point of inquiry was exploring the role of powerful intermediary groups, namely the ‘consulting actors’, in the transfer and implementations process of Western business models (including technological models) in these developing economies. This is a promising research site that is garnering a lot of interest in organisational researchers of late. This empirical contribution can also be narrated in terms of a significant theoretical contribution, because the role of the ‘human agency’, especially in the context of exploring the role of these powerful intermediaries, is less explored in the socio-material theory. It is argued that this theoretical contribution is in line with the socio-material theory that emphasises understanding the role of human agency as central in the interplay of organisation, technology and society.

Additionally it was also noted that the socio-economic conditions faced by K-Electric were not unique to the company, as most of the recently privatised companies (as a direct result of the IMF and World Bank’s influence) in Pakistan were facing a very similar set of problems. Furthermore, it was observed that not only Pakistani companies, but other companies based in emerging Asian economies were surrounded by the same socio-economic environment. For example the work of Jones & Hardstaff, (2005) is a useful paper that underpins how the IMF and World Bank, in the name of assistance through their provision of conditional loans, implement their preferred practices at state level, that in return effects the working patterns of industries and individual organisations operating within them. As an important part of their analysis of the role of these macro-economic players, Jones and Hardstaff, explain how different societies (within these emerging economies) are of late resisting and dismissing the policies of the IMF and World Bank. They conclude that this is because emerging societies are now becoming increasingly skeptical about the claimed ‘philanthropic role’ of these institutions (2005).

Appendix 1

List of Acronyms

ACP:	Automatic Cheque Printing
ADB:	Asian Development Bank
ANT:	Actor Network Theory
B&I:	Billing and Invoicing
CCS:	Customer Care Services
CEO:	Chief Executive Officer
CR:	Critical Realism
CRM:	Customer Relationship Management
DGM:	Deputy General Manager
DM:	Device management
EDM:	Energy Data Management
EPCL:	Engro Polymer & Chemical Limited
ERP:	Enterprise Resource Planning
ES:	Enterprise Systems
ESAF/EFF :	Enhanced Structural Adjustment Facility/ Extended Fund Facility
GM:	General Manager
GOP:	Government Of Pakistan
HCM:	Human Capital Management
HRM:	Human Resources Management
IBC:	Integrated Business Centers
ICAEW:	Institute of Chartered Accountants England and Wales
IFC:	International Finance Corporation
IMF:	International Monetary Fund

IPP: Individual Power Producers

IS: Information Systems

KESC: Karachi Electricity Supply Company

KWSB: Karachi Water and Sewerage Board

LPT: Labour Process Theory

MM: Material Maintenance

MW: Mega Watt

NEPRA: National Electric Power Regulatory Authority

NTDC: National Transmission and Distribution Company

PKR: Pakistani Rupee

SAP: System Application Product

SBA: Stand By Agreement

SD: Supply and Distribution

SDPI: Sustainable Development Policy Institute

SOEs: State Owned Entities

STS: Socio-technical Systems

T & D: Transmission and Distribution

VAT: Value Added Tax

WAPDA: Water and Power Development Authority

Appendix 2

K-Electric Interview Transcript (1st round of data collection, within organisation)

1. What was the impact of the privatisation on K-Electric's day to day business operations?
2. What immediate changes were introduced after the privatisation of the company?
3. Can you please tell me about the concept of IBCs and how do they work in practice?
4. How did the company operate its business before IBCs were introduced?
5. Is the idea of integrating business units new to the company or is applied in other companies in Pakistan as well?
6. Where did the idea of IBC come from?
7. Why were IBCs chosen and not other forms of organisation?
8. Was there any involvement of local or foreign consultants in promoting or implementing the IBCs?
9. What role did the IMF or World Bank play in the privatisation of K-Electric?
10. Did the IMF or consultants provide training to the staff now working in different IBCs?
11. How do you find these trainings?
12. How have business operations changed from before due to opening of IBCs?
13. How do you find working in new IBC environment?
14. Are there any documents, meeting minutes or reports from that period that I might have access to?
15. In future can I come to you again for interview with more specific questions and ask you for help?
16. Can you please put me in contact with other members of the staff?

K-Electric Interview Transcript (2nd round of data collection, within organisation)

1. Can you please tell me about the working of SAP system technology put in practice by K-electric recently?
2. Can you tell me about its functionality, its various components and give some examples to elaborate?
3. How has the SAP technology effected the day to day operations of company, can you please give me some examples from your own experience?
4. Do you think SAP technology has helped the K-electric to improve its business processes and how?
5. How satisfied are you with the implementation of SAP technology?
6. Can you put me in contact with other staff, IT team or advisors who were involved in the implementation of SAP system?
7. Can you please give me some material like documents, meeting minutes or reports that might help with understanding the SAP system?
8. Can I contact you in case I need some clarification?

K-Electric Interview Transcript (2nd round of data collection, outside organization)

Questions for customers

1. In which part of Karachi do you live?
2. Can you please describe your experience of being a K-electric customer?
3. Have you ever launched a complaint at your local IBC for any reason? Can you please tell me the procedure to record a complaint and was your complaint resolved, if so in how much time?
5. Do you feel any improvement in the quality of customer services being provided in the newly opened IBCs?
6. How many hours of black outs do you face daily?
7. Is the blackout scheduled or do you observe any unscheduled black-outs as well?
8. Are the hours of blackout constant throughout Karachi or they differ depending on area?
9. If any fault occurs in the line (in your area) how much time does it take for electricity to be restored?
10. Do you feel any improvement in electricity shortage in post privatisation period, like the reduction in the blackout hours?
12. Do you feel your electricity bill every month is justified?
13. Have you ever got a modified/corrected bill after launching the complaint?

Appendix 3

Process of Data Analysis

Main Codes	Data Generated Themes
Economic context surrounding K-Electric	<ul style="list-style-type: none"> -Economic instability of Pakistan -Dependence of Pakistan on international aid -Visible Influence of the IMF and World Bank - Privatisation of energy sector instructed by the IMF and World Bank - Privatisation of K-Electric as a result of that.
K-Electric company	<ul style="list-style-type: none"> -Started working under the control of NEPRA. -Foreign top management took over the control -New management had entirely different method of working, new in Pakistan's Context -360 degree change in how the company traditionally operated. -Cultural change management program - Extensive marketing campaign to rebrand the company as customer focused -Adoption of west inspired business model - Major technological change -Opening of IBC branches throughout the city
SAP Technology	<ul style="list-style-type: none"> -Integrated technology platform -Generation, transmission, supply and distribution transferred on SAP -Compatibility of SAP with other programs

	<p>i.e, smart grid system, advanced metering component, CRM component.</p> <ul style="list-style-type: none"> -Complete automation of all core business functions -Visual division of Karachi city in different regions. - Introduced online issuance and payment of bill -Introduced online complaint system
<p>Societal context</p>	<ul style="list-style-type: none"> - Division of customers into categories (wealthy, average, poor) -Different policies/rules for residents of different categories. -Wealthy areas exempt from load shedding -Average and poor areas facing many problems including, low maintenance of infrastructure, long hour black outs, low voltage, wrong billing. -Company deliberately penalising customers. -Company putting unjustifiable charges in customer bills -Non responsive customer care centres -No amendments in wrongly issued bills

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